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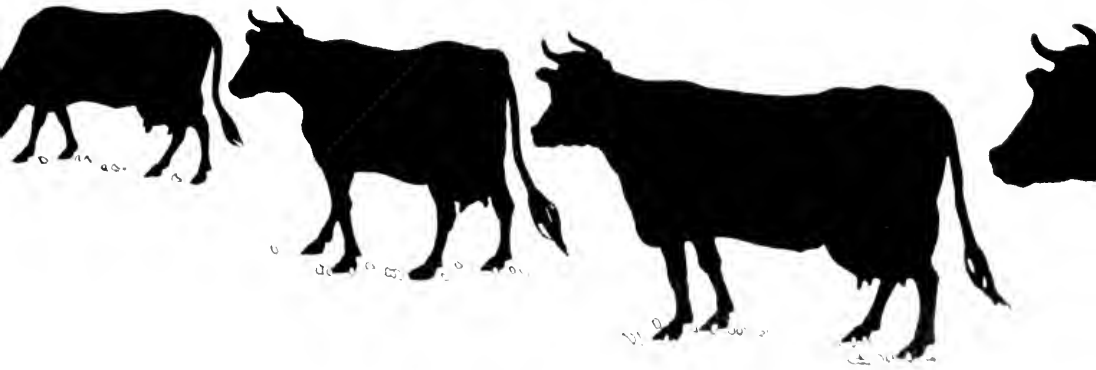
Half a Ton of Butter per Cow per Year



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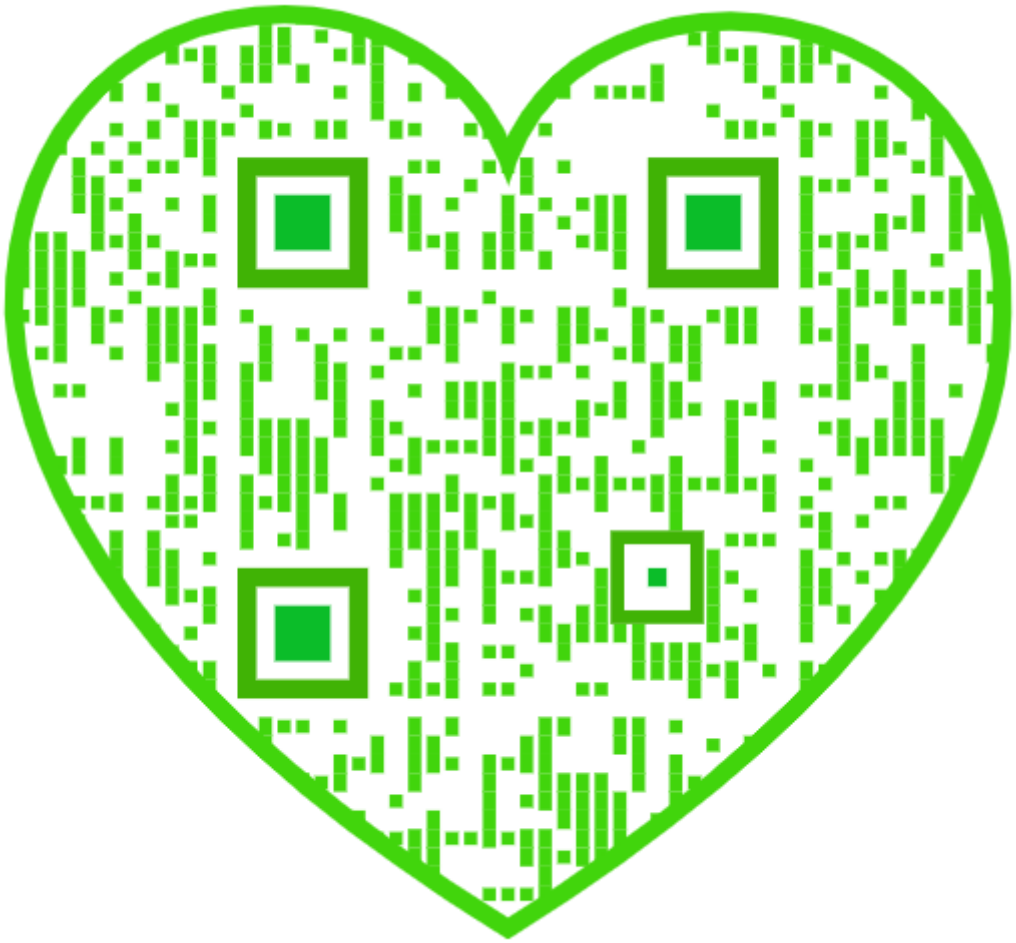

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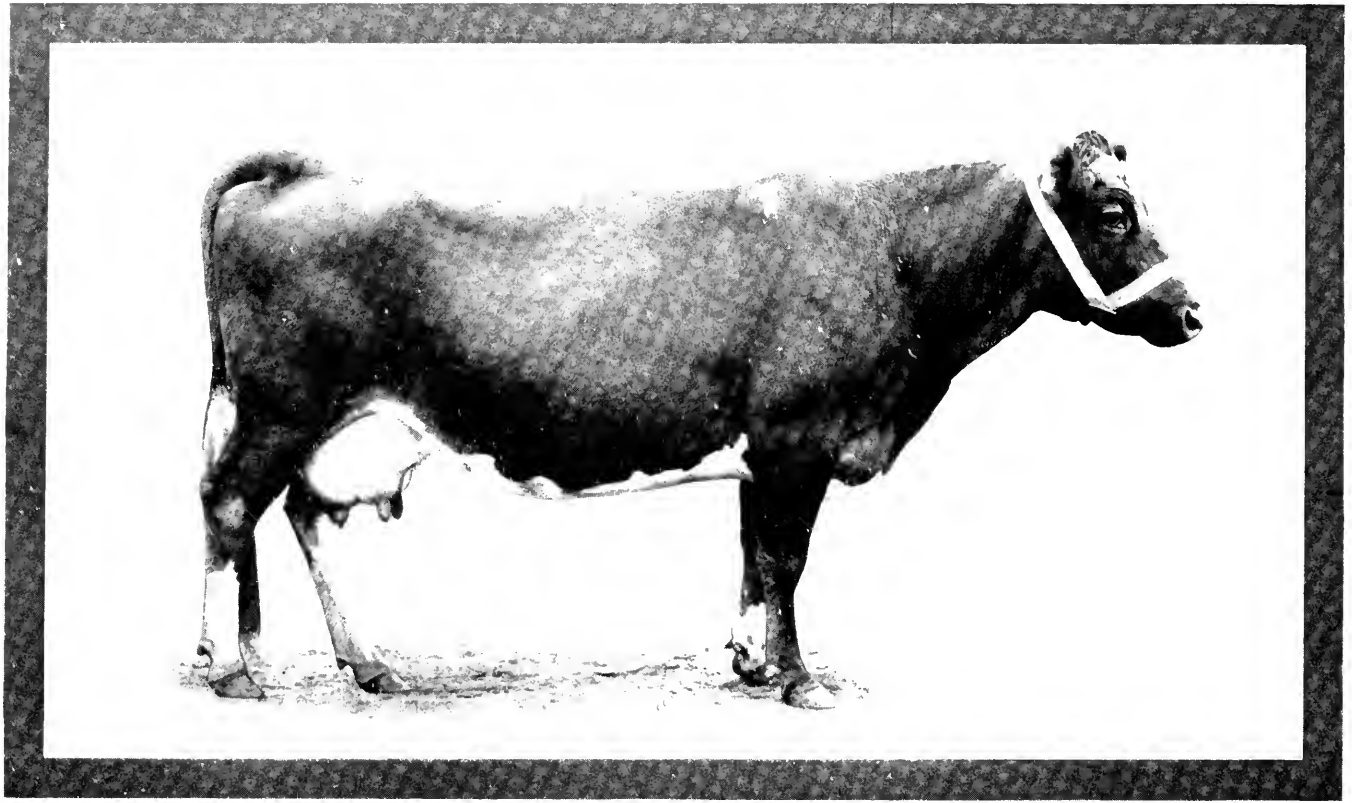

YESKA SUNBEAM, A GUERNSEY

The first cow in the United States to produce more than 1,000 pounds of butter in a year. Bred by W. D. Richardson, of Minnesota. Sold to Fred. Rietbrock, Athens, Wisconsin, by whom the test was made.

© DA 27 S 22

Half a Ton of Butter Per Cow Per Year

BY

Hugh G. Van Pelt

Feeder of the Winning Dairy Herd in the Cow Demonstration at the Louisiana Purchase Exposition, St. Louis, Mo., 1904

Others Have Done It
Why Not You?

Published by

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INTRODUCTION

In round numbers the wealth produced each year by the cows of the United States is $800,000,000—an amount equal to one-ninth of all the wealth returned from agriculture.

This sounds like an immense amount. It is. But we find it anything but a remarkable figure when we remember that 22,000,000 cows are required to yield this wealth. Of this number 7,000,000 are actually milked at a loss, 7,000,000 barely pay for their feed, while all the profits from dairy products are earned by the other 8,000,000 cows.

In other words, if the farmer were to butcher the 14,000,000 unprofitable cows his net profits from dairying would be considerably larger.

Such a course would mean a big decrease in the total butter yield and a great scarcity of dairy products. This would never do. Already the demand exceeds the supply. Besides, the farm would be robbed of a great amount of fertility.

Clearly the proper course is not to reduce the number of cows, but if possible to increase the productiveness of each cow. Can the cow's average butter yield be increased? It can, materially. With few exceptions the cow of to-day is not a bit better than the cow of a century ago. In summer she is allowed to shift for herself. Little care is taken in breeding. She is fed and sheltered in a haphazard manner through the winter, and often carelessly milked at irregular hours.

The bare truth is, the farmer has not yet put into the breeding, feeding and care of his cows the same spirit of progress which replaced the cradle with the harvester and the hoe with the cultivator.

He is getting on the average only 140 pounds of butter per year from each cow. This amount can be made twice as large by the adoption of proper methods of feeding, and again doubled by careful breeding that will do away with profitless cows and keep developing the profit-making ability of the good cows.

The success which has been achieved along these very lines, by a certain class of dairymen who have made a study and a business of dairying, proves that we are not overstating.

Great advance has been made by these progressive dairymen toward building up herds of high butter average. They have demonstrated that dairying, properly conducted, will pay the farmer surer, bigger and more uniform profits than any other branch of agriculture.

During the past four years seven cows have yielded the unprecedented amount of 1,000 pounds of butter or over in a year, under authenticated tests.

This not only reveals the possibilities of butter production which exist in the cow, but proves how practical and valuable are the methods used by leading dairymen, and that there must be secrets known to the breeders and feeders of these cows that would be of greatest value to all dairymen.

Not one of these record-making cows could have reached the 1,000-pound mark had they been confined in dark, damp, cold, poorly ventilated barns with nothing to eat except timothy-hay, corn, straw and corn fodder—given little care and attention, and carelessly milked at irregular intervals.

While it cannot be expected that all or even a majority of the rank and file of milk cows can be developed into 1,000-pound cows, there are thousands of cows capable of producing from 500 to 1,000 pounds of butter. They are giving less because they are not getting feed of sufficient nourishment, are not properly quartered, etc.

The methods which were used successfully to develop the 1,000-pound cows, and the many other hints of feeding and caring for cows used by the most successful dairymen as set forth in this book, can be put into profitable practice by every cow owner in the United States, whether he has a herd of 100 or whether he pastures just one cow on a vacant city lot.

Cows Producing More Than 1,000 Pounds of Butter in a Year

The world is just beginning to realize the wonderful possibilities that exist in the dairy cow. That a cow capable of producing 1,000 pounds of butter in a year could be developed would have been jeered at as recently as ten years ago.

The records given in this book have been accepted by the breed associations to which the cows belong, and are considered by such associations as absolutely correct and honest. The making of wonderful records is yet in its infancy, and in years to come there will be scores of cows that will pass the half-ton mark of butter in a year's time. Hundreds of dairy cows are now undergoing yearly authenticated tests. The number can only be estimated, but roughly speaking it is safe to say from 1,500 to 2,000.

In none of these tests was the butter actually churned from day to day. The production of butterfat was determined by weighing the milk at each milking, testing it with the Babcock test to determine the percentage of butterfat contained in the milk, multiplying the pounds of milk by the percentage of butterfat, and thus determining the total pounds of butterfat per day, week, month and year.

There is some difference of opinion relative to the amount of extra weight, or overrun, as it is technically termed, that should be added to the actual butterfat found in the milk by the Babcock test. The Federal laws of the United States permit the buttermaker to incorporate in every 100 pounds of butter that he manufactures 16 pounds of water, in addition to the salt and curd that naturally become associated with the butterfat.

It is, therefore, possible for the buttermaker oftentimes to secure an overrun of from 20 to 23 per cent. Many breeders of dairy cattle believe because of this fact that the cow should be given credit of at least 20 per cent. more of actual commercial butter than she has produced butterfat.

In this manner the total amount of butterfat determined by the Babcock test has been taken as the basis and the cow given credit with from 16 2-3 per cent. to 20 per cent., which is even

less credit than she would have received had the total amount of butterfat been made up into butter from day to day by an experienced buttermaker.

The subsequent history of great cows which have undergone these tests and made good depends upon what they were before the beginning of the test, and how they were cared for and fed during their work. In every instance where the cow was strong in every respect, vigorous and a regular breeder, there are no undesirable effects which follow. On the other hand, the results of having accomplished the work one year develops and strengthens, perhaps as hard work strengthens a man's muscles, the digestive apparatus, the blood circulation and the ability to produce great amounts of milk and butterfat. It is sometimes believed that continued hard work of the character accomplished by half-ton cows tends to shorten the life of the animal. This may be true to an extent, but in view of the fact that every cow thus far accredited with having made a half ton of butter in a year is still living, goes a long way toward disproving this idea. It would seem to be more a matter of whether or not judgment was used in feeding and caring for the cow, than a question of how much milk and butterfat she produced in a year that determined her longevity.

In one instance the cow has not produced living offspring since her test. This can hardly be attributed as a result of her work or the manner in which she was fed and cared for during her test, because she had not yet been a regular breeder during her former lifetime. In the other instances valuable sons and daughters have followed, and are following, in the footsteps of their mothers. However, as it has been only a few years since the first 1,000-pound record was made, time will be required to determine the true greatness of the offspring of these cows.

As truly as the law that "like begets like or a likeness of some ancestor" is true, the daughters of these greatly bred sires will produce great records when they are given an opportunity. Authorities on breeding, as a rule, agree that likely the alternate generation, or in other words, the daughters produced by the sons of great cows, can be expected to be greater producers than the own daughters of the cows.

Yeska Sunbeam the First Cow to Do It

Yeska Sunbeam was bred by W. D. Richardson, of Minnesota. It has been rumored that she was sold to Fred. Rietbrock, of Helendale Farms, Athens, Wis., for $75 or $85. If this be true, her owner never realized her wonderful possibilities. She was dropped April 2, 1895, and was thus about nine and a half years old when she began her test. She calved September 11, 1904, and the test began October 1st. She is an easy milker.

One of Mr. Rietbrock's favorite ways of discoursing on the production of dairy cows starts as follows:

"In the matter of economic production of milk and butterfat there are three factors—namely, first, the man; second, the cow; and third, the feed. If the man can succeed in bringing the cow and the feed together, proper proportions and quality of each, and then have the cow so handled that she and her attendants are in perfect harmony and accord, a great record is no longer a matter of conjecture. It is an assured fact from the beginning."

THE YEAR'S RECORD OF YESKA SUNBEAM.

Month.	Lbs. of Milk.	Percentage of Butterfat.	Lbs. of Butterfat.	Lbs. of Butter.
October, 1904	1,428.2	5.69	81.26	101.58
November	1,322.5	5.62	74.32	92.90
December	1,294.4	6.08	78.70	98.40
January, 1905	1,217.0	6.04	73.51	91.88
February	1,060.8	5.75	61.00	76.25
March	1,185.1	6.05	71.70	89.62
April	1,089.6	5.79	63.09	78.86
May	1,127.5	5.75	64.83	81.03
June	1,158.4	5.25	60.82	76.02
July	1,266.0	5.88	74.44	93.05
August	1,463.8	5.42	79.34	99.17
September	1,307.5	5.67	74.14	92.67
Total	14,920.8	5.74	857.15	1,071.43

The manner in which Yeska Sunbeam was fed is given by Mr. Rietbrock, her owner, as follows:

"During grazing season excellent blue grass and clover pasture; in the late fall and spring of the year, supplemented with some clover hay as roughage, and during July and August, 1905,

COLANTHA 4TH'S JOHANNA

A Champion Holstein. Bred and owned by W. J. Gillette, Rosendale, Wisconsin. One of her calves has been sold for $8,000 cash.

during hot weather and fly time, oats and peas in the green state as soiling crop. In August and September some green corn. During the winter season, while stabled, from 25 to 30 pounds of corn silage made of corn that was planted so close together that the ears did not develop; also good clover hay, and part of the time some alfalfa hay. Off and on during the winter she was also fed some rutabagas.

"Her grain feed consisted of a mixture of grain made up as follows: Four parts wheat bran, two parts ground oats, two parts gluten feed, one part old process oil meal. During the months of January, February and March there was added to this mixture one part of corn meal. During the months of October, November and December, 1904, she was fed 15 pounds a day of this grain mixture. During January, February, March and April, 14 pounds a day. During May, 12 pounds, and during June the quantity varied from 12 pounds to 6 pounds. For July, August and September she was fed from 9 to 10 pounds of this grain mixture."

The Performance of Colantha 4th's Johanna, the World's Champion

Colantha 4th's Johanna, a Holstein cow, was bred and raised by W. J. Gillette, of Springvale Farms, Rosendale, Wis. Her marvelous record is an indication of what can be accomplished in the developing of dairy cattle by the son remaining on the farm and following up the work started by the father.

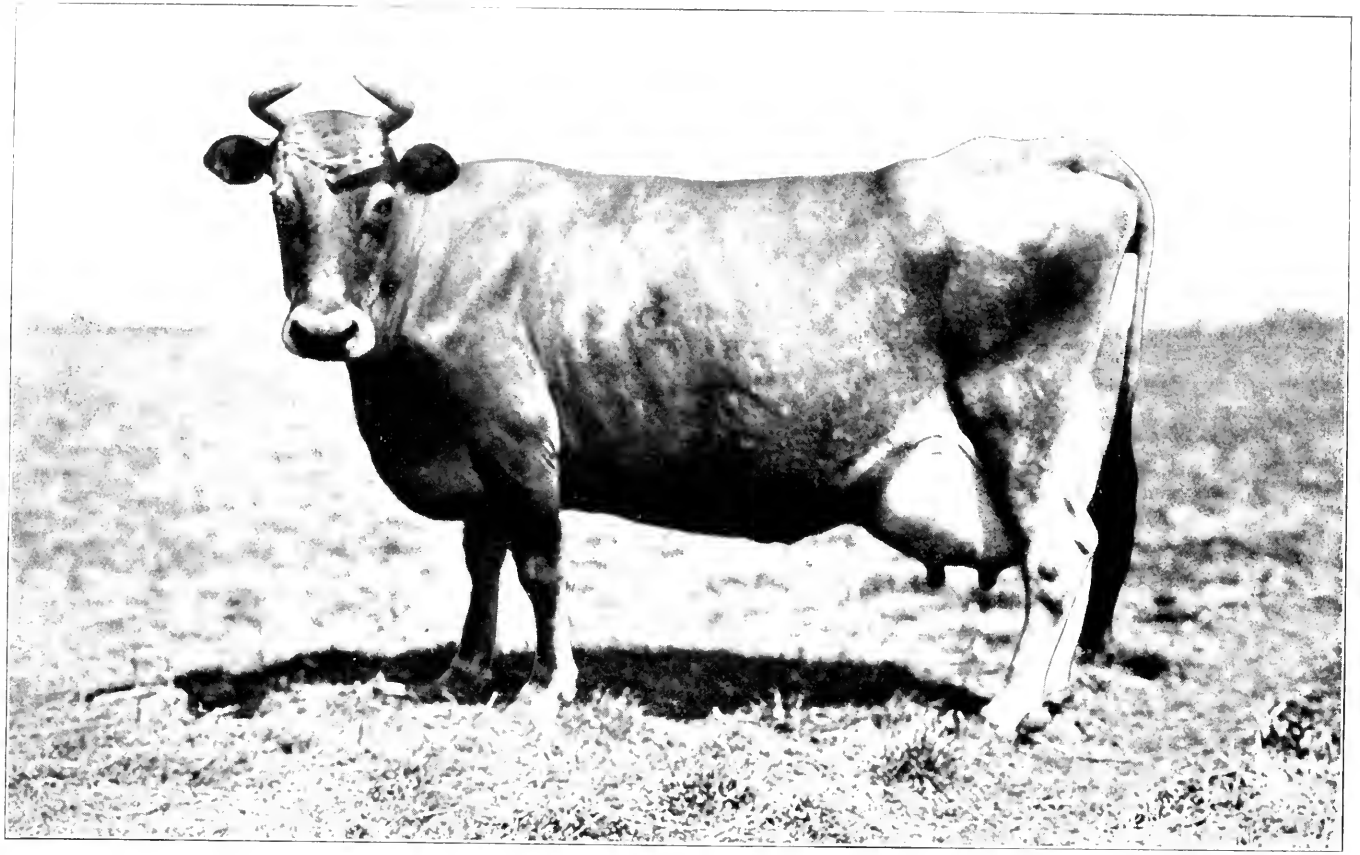
The commercial value of a cow of this type is indicated by her owner, who states that her record would sell her bull calves, should she drop one every year, at prices upward of $6,000 each. And one never knows whether he owns a record-breaking cow or not unless he determines the truth in the only sure way—*i. e.*, by the use of a $10 outfit consisting of scales, milk sheet and Babcock test. Although an owner believes he knows all about the individual merits of his cows, yet an incident in Mr. Gillette's experience shows the value of making sure. Before Colantha 4th's Johanna made her record, one of her bull calves was sold for $300. After her record had been made, Mr. Gillette purchased the calf for $2,000 and resold him to head one of the greatest Holstein herds in the world for $8,000 cash.

SEMI-OFFICIAL YEARLY MILK AND BUTTERFAT RECORDS OF COLANTHA 4TH'S JOHANNA, CONDUCTED BY THE WISCONSIN EXPERIMENT STATION.

Month.	Lbs. of Milk.	Percentage of Butterfat.	Lbs. of Butterfat.	Lbs. of Butter.
December, '06, 9 days.	627.8	4.35	27.30	34.13
January	2,657.5	3.92	104.27	130.34
February	2,677.5	3.83	102.54	128.18
March	2,701.3	3.67	99.13	123.92
April	2,508.7	3.56	89.31	111.63
May	2,643.2	3.56	94.09	117.62
June	2,353.7	3.45	81.20	101.50
July	2,235.2	3.37	75.32	94.15
August	1,788.6	3.95	70.65	88.30
September	1,756.1	3.69	64.80	81.20
October	2,031.8	3.30	67.04	83.81
November	1,994.6	3.61	72.00	90.00
December, 22 days	1,456.5	3.47	50.54	63.17
Total	27,432.5	3.64	998.19	1,247.95
Equivalent butter 85.7 per cent. fat				1,164.64

To quote the words of W. J. Gillette: "During the first 65 days of her test she was fed a grain ration varying from 12 to 24 pounds per day of a mixture equal parts bran, gluten and ground oats, to which were added as a part of the total day's ration from two to three pounds oil meal per day. She did her best work on a total grain ration of 18 to 22 pounds per day, showing some falling off the lone week when we increased the grain to 24 pounds. Her roughage was all the clover she wanted, 32 pounds of silage per day and 30 pounds roots per day. At the close of the 65-day test silage was substituted for the roots, and she was continued on this ration till grass came; her grain ranging from 18 to 22 pounds per day, consisting of the above mentioned four varieties. In June she was turned on to grass and her grain reduced to from 8 to 12 pounds per day, corn meal being substituted to the extent of 50 per cent. for the gluten. She remained on pasture till stabling time in the fall, receiving no further attention than other members of the herd. In October she was again put on to her winter ration and grain raised to 18 pounds per day, mixture as above. During the first three months she was kept in the stable all the time except a walk once in a while on pleasant days. Had this cow had the attention and advantages that some cows have with which they have tried to excel her performance, I am sure her yield would have been increased at least 2,000 pounds milk, and from 60 to 70 pounds of fat. In feeding and caring

for cows with best results, many details must be considered. Like a work team which goes into the field for a long siege, a cow must be conditioned for it in order to give her the necessary strength for the endurance of long-continued production. Digestion and assimilation must be keenly observed by the caretaker, and variety of feeds should be palatable, adapted to the special individual, properly balanced and placed before the cow in an attractive and appetizing manner. The skill of the feeder lies in knowing the characteristics of the different cows under his charge, something no feeder can explain and only experience can teach. Overfeeding is more injurious than underfeeding, for overtaxing the powers of digestion and assimilation weakens and draws upon the whole system, any slight derangement of which will strongly manifest itself in the pail. Colantha 4th's Johanna at the completion of her great year was as lively and vigorous and in as good condition as she was the day we started her, and I can positively say that her work was not the slightest injury to her in any way, and had she not aborted, as did many of my herd, the following period, I believe she could have repeated the performance, if not excelled it."



JACOBA IRENE

Champion Jersey cow. Owned by A. O. Auten, Jerseyville, Illinois. The world's "Champion Long-Distance Butter Cow"; has averaged more than 1,026 pounds of butter per year for two successive years.

Record-Making Feat of Jacoba Irene, 146443; Champion Long-Distance Dairy Cow of the World

Jacoba Irene is a registered Jersey, born and raised to cowhood in Nebraska, and little was known of her real value until she was sold at public auction at a price for which good purebred Jersey cows were accustomed to sell at such auction sales six years ago. It may be said that at the present time, since the true value of dairy cows is being learned by the present-day method of testing them, that grade cows have in the past year sold for more money than was paid for Jacoba Irene at the time she passed under the auctioneer's hammer. Her history, like that of other wonderful cows, is additional proof of the value of absolutely knowing the character of the work of each individual cow.

That Jacoba Irene is a very prolific cow is indicated by the fact that she calved on May 22, 1904; December 11, 1905; December 10, 1906; January 24, 1908; in October, 1909, and is due to freshen again next December. Beginning May 22, 1904, Jacoba Irene produced in 37 months three living calves and 2,755 pounds of butter. This is the most wonderful record of a cow known in history, and establishes her with the title of the "Champion Long-Distance Dairy Cow of the World."

Jacoba Irene was nine years and ten months old at the beginning of her test. As to her value, Aaron O. Auten, of the Auten Farms, Jerseyville, Ill., who owns her, says: "Of course, I have no fixed price on her value now, but she is paying me big interest on $10,000 per annum. I do not intend to push her for another test, but we are authenticating her work this year just the same, and she has been milking from 42 to 52 pounds since she last freshened. Her first month's work was only six pounds of butterfat less than her first month's work last year, which was the year of her great record."

AUTHENTICATED RECORD FOR TWO YEARS, December 11, 1905, to January 24, 1909—Dry 45 Days.

Milk	31,505 lbs., 9.6 ozs.
Butterfat	1,744 lbs., 13.4 ozs.
Butter 85 per cent. fat	2,053 lbs., 15.3 ozs.

This record has never been equaled or approached by any cow. Jacoba Irene is the officially established world's champion

long-distance butter cow. She averaged over 1,026 pounds of butter per year for two successive years.

AUTHENTICATED FAT ESTIMATE FOR ONE YEAR.

Date.	No. Days.	Lbs. of Milk.	Percentage of Butterfat.	Lbs. of Butterfat.
Jan. 25 to Feb. 24, 1908.	31	1,600.3	4.77	76.36
Feb. 25 to Mar. 24	29	1,857.1	4.52	83.94
Mar. 25 to Apr. 24	31	1,969.9	5.33	104.99
Apr. 25 to May 24	30	1,825.1	5.13	93.62
May 25 to June 24	31	1,811.8	5.41	98.01
June 25 to July 24	30	1,594.5	5.73	91.36
July 25 to Aug. 24	31	1,383.3	5.99	82.85
Aug. 25 to Sept. 24	31	1,307.3	5.84	76.39
Sept. 25 to Oct. 24	30	1,122.0	6.46	72.48
Oct. 25 to Nov. 24	31	1,032.4	6.35	65.55
Nov. 25 to Dec. 24	30	885.8	5.85	51.81
Dec. 25 to Jan. 24, 1909.	31	863.7	6.43	55.53
Total	366	17,253.2	5.22	952.89

Estimated butter on basis of 85 per cent. fat, 1,121 lbs., 2 ozs.
Estimated butter on basis of 80 per cent. fat, 1,191.20 lbs.

FEED OF JACOBA IRENE DURING HER YEAR'S TEST.

Roughage.	Weight, Lbs.	Cost.	Total Cost.
Silage	7,410.0	$11.12	
Cut alfalfa	1,074.0	8.06	
Hay	3,000.0	15.00	
Total	11,484.0		$34.18
Grain.			
Bran	1,693.5	$18.97	
Ground corn	660.5	6.60	
Oil meal	488.5	7.80	
Gluten	1,614.5	24.21	
Ground oats	363.5	4.53	
Alfalfa fat	14.5	.14	
Total	4,835.0		62.25
900 hours on pasture.			$96.43

The Guernsey Cow Dolly Dimple, 19144, Adv. R. 628, Excels All Other Cows of Like Age in the World

She was sired by Yeoman 11819, the son of Hayes Rosiè, with a yearly record of 14,533.08 pounds of milk containing 714.31 pounds of butterfat. The mother of Dolly Dimple was Dolly Bloom, with three great yearly records—namely, as a two-year-old, 8,841.5 pounds of milk and 453.86 pounds of butterfat; as a three-year-old, 12,674.8 pounds of milk with 623.95 pounds of butterfat; as a five-year-old, 17,297.5 pounds of milk and 836.21 pounds of butterfat. (See illustration page 42.)

At the conclusion of her year's work she was two months with calf. When she freshened for the second time in October she started her second year's work, and has just completed same with an official year's record of 18,458.80 pounds milk, 906.89 pounds butterfat.

RECORD FROM OCTOBER 14, 1908, TO OCTOBER 14, 1909. SUPERVISED BY MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Month.	Lbs. of Milk.	Percentage of Butterfat.	Lbs. of Butterfat.	Lbs. of Butter.
October, 1908	927.10	4.49	41.63	52.05
November	1,898.60	4.49	85.25	106.55
December	1,909.60	4.81	91.85	114.80
January, 1909	1,807.40	4.90	88.56	110.70
February	1,505.80	4.53	68.21	85.25
March	1,663.10	4.66	77.50	96.85
April	1,569.90	4.96	77.87	97.35
May	1,531.30	5.13	78.56	98.20
June	1,439.20	5.45	78.44	98.05
July	1,371.10	4.97	68.14	85.15
August	1,270.10	5.54	70.36	87.95
September	1,105.10	5.14	56.80	71.00
October	460.50	5.15	23.72	29.65
Total	18,458.80	4.91	906.89	1,133.55

Dolly Dimple was dropped January 21, 1905, making her three years and nine months old at the beginning of her last record.

Feed Eaten During Last Record.

October—27 lbs. bran, 18 lbs. pea meal, 18 lbs. Ajax Flakes, 27 lbs. ground oats, 27 lbs. gluten, 18 lbs. oil meal, 18 lbs. cottonseed meal, 18 lbs. alfalfa meal, 9 lbs. hominy, 144 lbs. beet pulp, 180 lbs. corn fodder, 360 lbs. roots, 360 lbs. ensilage and 180 lbs. hay.

November—54 lbs. bran, 36 lbs. pea meal, 36 lbs. Ajax Flakes, 54 lbs. ground oats, 54 lbs. gluten, 36 lbs. oil meal, 36 lbs. cottonseed meal, 36 lbs. alfalfa meal, 18 lbs. hominy, 200 lbs. beet pulp, 600 lbs. roots, 450 lbs. ensilage and 240 lbs. hay.

December—56.7 lbs. bran, 37.8 lbs. pea meal, 37.8 lbs. Ajax Flakes, 56.7 lbs. ground oats, 56.7 lbs. gluten, 37.8 lbs. oil meal, 37.8 lbs. cottonseed meal, 37.8 lbs. alfalfa meal, 18.9 lbs. hominy, 279 lbs. beet pulp, 620 lbs. roots, 620 lbs. ensilage, 310 lbs. hay.

January—60.45 lbs. bran, 40.30 lbs. pea meal, 40.30 lbs. Ajax Flakes, 60.45 lbs. ground oats, 60.45 lbs. gluten, 40.30 lbs. oil meal, 40.30 lbs. cottonseed meal, 40.30 lbs. alfalfa meal, 20.15 lbs. hominy, 248 lbs. beet pulp, 310 lbs. hay, 620 lbs. roots, 620 lbs. ensilage.

February—58.5 lbs. bran, 39 lbs. pea meal, 39 lbs. Ajax Flakes, 58.5 lbs. ground oats, 88.5 lbs. gluten, 39 lbs. oil meal, 39 lbs. cottonseed meal, 39 lbs. alfalfa meal, 19.5 lbs. hominy, 224 lbs. beet pulp, 840 lbs. roots, 560 lbs. ensilage, 280 lbs. hay.

March—58.5 lbs. bran, 39 lbs. pea meal, 39 lbs. Ajax Flakes, 58.5 lbs. ground oats, 58.5 lbs. gluten, 39 lbs. oil meal, 39 lbs. alfalfa meal, 19.5 lbs. hominy, 225 lbs. beet pulp, 840 lbs. roots, 560 lbs. ensilage, 280 lbs. hay.

April—58.5 lbs. bran, 39 lbs. pea meal, 39 lbs. Ajax Flakes, 58.5 lbs. ground oats, 58.5 lbs. gluten, 39 lbs. oil meal, 39 lbs. alfalfa meal, 19.5 lbs. hominy, 39 lbs. cottonseed meal, 224 lbs. beet pulp, 850 lbs. roots, 560 lbs. ensilage, 280 lbs. hay.

May—51.6 lbs. bran, 34.4 lbs. Ajax Flakes, 34.4 lbs. pea meal, 51.6 lbs. ground oats, 51.6 lbs. gluten, 34.4 lbs. oil meal, 34.4 lbs. alfalfa meal, 34.4 lbs. cottonseed meal, 17.2 lbs. hominy, 620 lbs. roots, 248 lbs. beet pulp, 310 lbs. hay.

June—63 lbs. bran, 42 lbs. pea meal, 42 lbs. Ajax Flakes, 42 lbs. cottonseed meal, 63 lbs. ground oats, 63 lbs. gluten, 42 lbs. oil meal, 42 lbs. alfalfa meal, 21 lbs. hominy, 180 lbs. green feed, 150 lbs. hay and pasture.

July—69.8 lbs. bran, 46.5 lbs. pea meal, 46.5 lbs. Ajax Flakes, 46.5 lbs. cottonseed meal, 69.8 lbs. ground oats, 69.8 lbs. gluten, 46.5 lbs. oil meal, 46.5 lbs. alfalfa meal, 23.3 lbs. hominy, 248 lbs. beet pulp, 525 lbs. green feed, 240 lbs. hay.

August—72.09 lbs. bran, 48.06 lbs. pea meal, 48.06 lbs. Ajax Flakes, 72.09 lbs. ground oats, 48.06 lbs. cottonseed meal, 72.09

lbs. gluten, 48.06 lbs. oil meal, 78.06 lbs. alfalfa meal, 24.03 lbs. hominy, 248 lbs. beet pulp, 465 lbs. hay.

September—69.75 lbs. bran, 46.5 lbs. pea meal, 46.5 lbs. cottonseed meal, 46.5 lbs. Ajax Flakes, 69.75 lbs. ground oats, 69.75 lbs. gluten, 46.5 lbs. oil meal, 46.5 lbs. alfalfa meal, 23.3 lbs. hominy, 180 lbs. beet pulp, 300 lbs. hay.

October—30.3 lbs. bran, 10.1 lbs. hominy, 30.3 lbs. ground oats, 30.3 lbs. gluten, 20.2 lbs. pea meal, 20.2 lbs. cottonseed meal, 20.2 lbs. Ajax Flakes, 20.2 lbs. oil meal, 20.2 lbs. alfalfa meal, 130 lbs. roots, 156 lbs. hay.

During this time she made the following seven-day record, which is the largest made by any cow of like age:

December 8	62.4 lbs. milk,	3.20 lbs.	butterfat.
December 9	63.0 " "	2.90 "	"
December 10	65.8 " "	3.28 "	"
December 11	63.3 " "	2.85 "	"
December 12	66.4 " "	3.62 "	"
December 13	64.2 " "	3.42 "	"
December 14	59.7 " "	2.73 "	"
Total	444.8 " "	22.00 "	"

She has also to her credit the following records for shorter periods, which are the best for the breed, and as far as known she is the most remarkable producing cow of like age in the world:

One day—68.4 lbs. milk; 3.625 lbs. butterfat.

One month (30 days)—1,960.04 lbs. milk; 89.99 lbs. butterfat.

Three months—5,614.6 lbs. milk; 265.62 lbs. butterfat.

Six months—182 days (3½ years old), 10,390.2 lbs. milk; 486.66 lbs. butterfat.

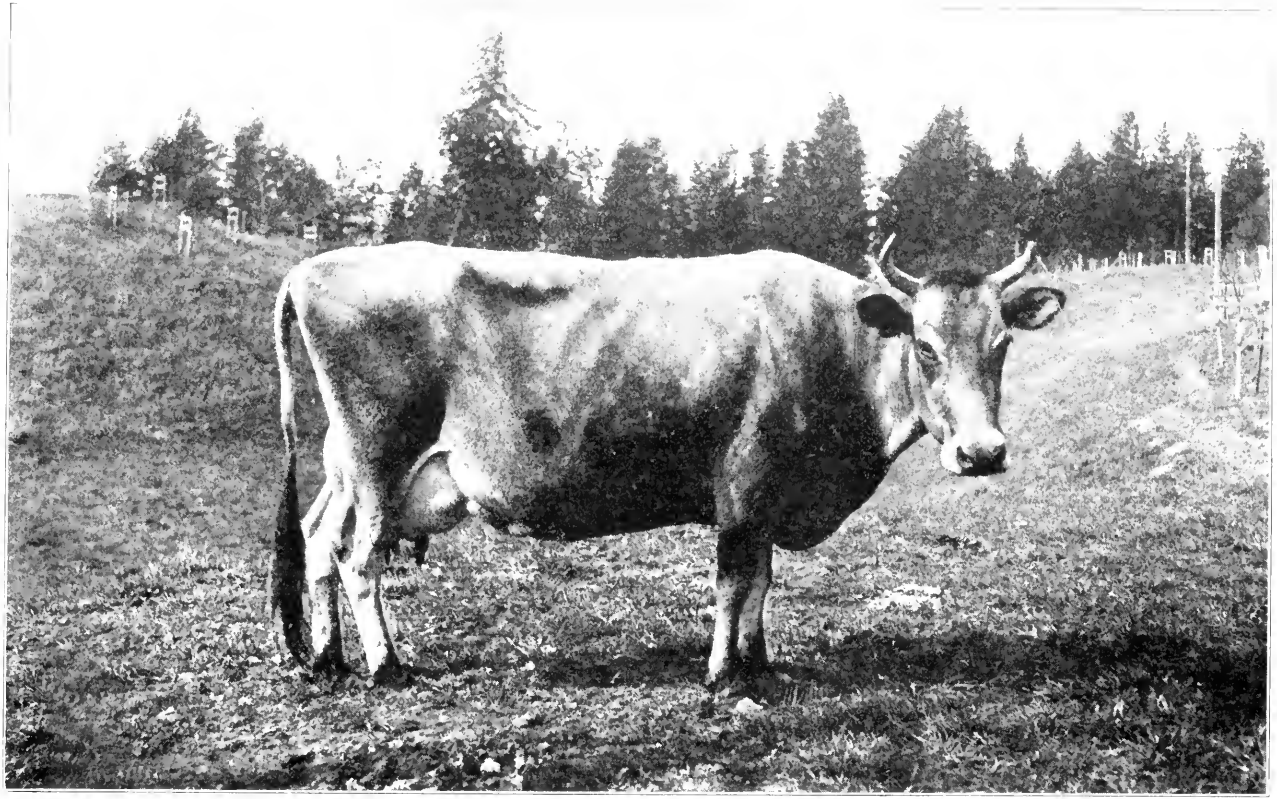
Average for two consecutive periods, 16,233.96 lbs. milk; 805.13 lbs. butterfat.

Dolly Dimple is owned at Langwater Farms, North Easton, Mass., the property of Mr. F. Lothrop Ames.

The Record of Olga 4th's Pride, 160791

Olga 4th's Pride, 160791, completed her year's authenticated record May 28, 1909.

This cow is a registered Jersey, bred and owned by George H. Sweet, of Beechlands, East Aurora, N. Y. She was seven years old at the beginning of the test. An interesting feature of her record is that her owner followed the work that his father started before him. This illustrates the wisdom of the young man on the farm to-day remaining there and adding to and



ADELAIDE OF BEECHLANDS

Jersey cow. Property of the W. S. Ladd Estate, Portland, Oregon. A tremendous milk machine that makes good use of her feed.

taking advantage of the accumulative results of the work started years before. Two of the three 1,000-pound Jersey cows, namely, Olga 4th's Pride and Adelaide of Beechlands, were the results of the breeding operations at Beechlands Farm. The fact that the grandmother, the mother, the sire, the sister and the daughter of Olga 4th's Pride were all bred and raised at Beechlands Farm, and all were wonderful individuals, not only of the Jersey breed, but highly representative of all dairy breeds, tells the story of the great possibilities in breeding and developing productive dairy cattle; but the important fact is that it required two generations of the Sweet family to accomplish these marvelous results.

RECORD.

Total milk for 365 days, 16,275.4 lbs.; fat, 851.77 lbs.

Total estimated butter, 85 per cent. fat, 1,001.29 lbs.

Best day's milk, 62.50 lbs. Average milk per day for 365 days was 44.59 lbs. Average fat per day for 365 days was 2.336 lbs. Average butter per day for 365 days, 85 per cent., was 2.743 lbs. Average fat test for the year was 5.233 per cent.

Her work previous to the authenticated year was as follows: With her first calf she gave 6,797.2 lbs. milk; with second calf, 8,674 lbs.; with third calf, 11,119.2 lbs.; with fourth calf, 14,460.4 lbs.; with her fifth calf (an authenticated year) she gave 16,275.25 lbs. The first four years she was not fed for heavy work.

Mr. Sweet says: "I saw to the feeding myself, but I do not keep an accurate account of the feed, as I change so often, and the changes are so varied that I do not try to keep any account of it."

These few words are full of meaning. They bare great feeding secrets. Mr. Sweet closely studied his cow. He knew from day to day the amounts and kinds of feeds she needed, and supplied them. A little later on we shall discuss this very point at length in a simple, practical manner.

Adelaide of Beechlands

This Jersey cow was bred by George H. Sweet, East Aurora, N. Y., and made her record while owned by the W. S. Ladd Estate, Portland, Ore.

At the age of two years and three months she began her year's record with 8,363 pounds 12.8 ounces of milk, which contained 435 pounds 4.7 ounces of butterfat. During the year she made her record of over 1,000 pounds of butter, her yield averaging per month 1,297.7 pounds of milk, containing 70.8 pounds of butterfat. Although her test began November 25, 1907, she gave birth to a living calf December 18, 1909. After finishing

her test the statement made by her owner was as follows: "She was not forced at all and is in perfect physical condition."

The following table shows her production from month to month, and also the amounts of different feeds used to stimulate the great production:

AMOUNT OF FEED CONSUMED BY ADELAIDE OF BEECHLANDS, 168699 A. J. C. C., DURING HER YEARLY TEST.

Bran Lbs.	Oats Lbs.	Oil Meal.	Clover Hay.	Kale.	Carrots	Alfalfa Hay cut.
10	10	5	45	....	...	...
93	93	31	217	1,240	...	...
93	93	31	217	1,240	...	...
116	87	29	203	480	290	...
124	93	31	217	....	558	...
90	30	..	90	Pasture	360	...
62	..		Extra English Rye			
30	..		and			
62	..		White Clover Pasture.			
62	62	15	62	1,085	Pasture	150
90	60	45	210	1,200	...	450
62	62	45½	217	1,240	...	465
48	48	36	168	960	...	360
942	638	268½	1,646	7,445	1,208	1,425

YEARLY WORK OF ADELAIDE OF BEECHLANDS, 168699 A. J. C. C., IN LADD'S HAZEL FERN HERD. AUTHENTICATED BY OREGON EXPERIMENT STATION.

	Days.	Lbs. of Milk.	Percentage of Butterfat.	Lbs. of Butterfat.	Lbs. of Butter.
November, 1907	6	226.8	4.39	9.97	12.46
December	31	1,420.6	4.56	64.84	81.05
January, 1908	31	1,436.6	4.64	66.79	83.45
February	29	1,310.7	4.95	64.92	81.15
March	31	1,374.6	5.38	74.02	92.50
April	30	1,340.7	5.24	70.37	87.95
May	31	1,418.3	5.44	77.24	96.55
June	30	1,343.6	5.38	72.30	90.40
July	31	1,310.7	5.13	67.27	84.10
August	31	1,306.4	6.05	79.05	98.80
September	30	1,228.4	6.21	76.37	95.45
October	31	1,124.7	6.62	74.47	93.10
November	24	730.0	7.12	52.01	65.00
Total	366	15,572.1	5.45	849.62	1,061.96

Dairymaid of Pinehurst

A Guernsey cow owned by W. W. Marsh, Waterloo, Ia., is the seventh cow to make a half ton of butter in one year. She yielded 852.89 pounds of butterfat, which is equivalent to 1,003 pounds of 85 per cent. butter. In many ways Dairymaid's record is the most wonderful of any previously discussed. She is the champion three-year-old cow of the world. When her test was begun she was only three years and twenty-five days old.

There are no indications that her work has in any way injured her future usefulness. She looks fit to yield even more butter next year.

The secret of her great work is simply that she is a good cow and has been given the opportunity.

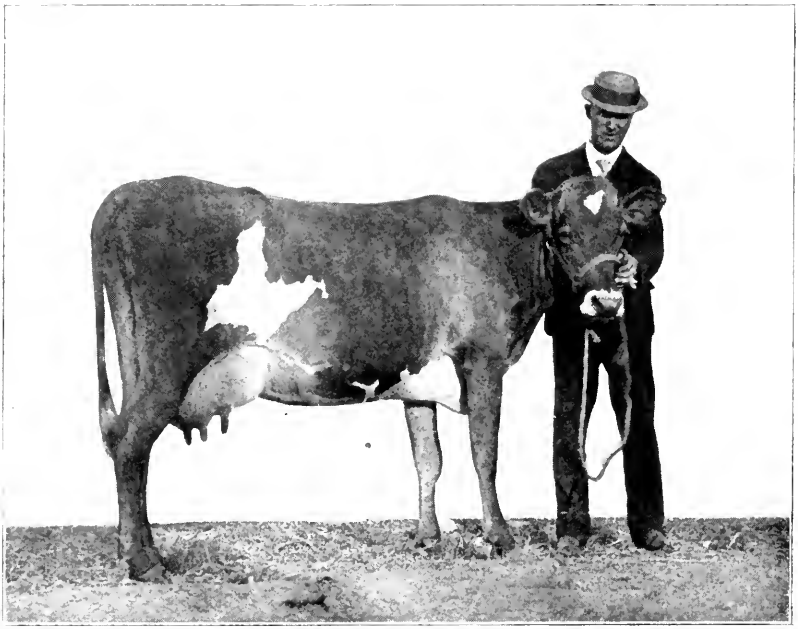
Mr. Marsh attributes much of the success attained by Dairymaid to the fact that she was given a large variety of foods, such as alfalfa hay, clover hay, corn silage, beets, carrots, mangels, beet pulp, oil meal, bran, ground oats, corn meal and other foods that would tempt her appetite and supply milk-making nutrients.

In early summer she was turned on luxuriant pasture, but when the days became hot and the flies bad she was placed in a roomy, well-bedded stall. The barn was well ventilated and kept cool. Green food was cut from the fields and brought to her. It paid. Cows cannot suffer from any cause and at the same time yield milk and butter to the limit of their ability.

It will be interesting to the reader to know that Mr. Marsh loaned Dairymaid of Pinehurst to the National Dairy Show Association as one of the great features of the Chicago show, 1910, and refused an offer of $10,000 for her. Her son, barely a year old, is a grand individual, as is indicated by the fact that at the Iowa State Fair he won first prize as a calf and Junior championship, winning this prize over all Guernsey bulls under two years old exhibited at that fair. Dairymaid of Pinehurst is due to freshen again on Christmas day, and her phenomenal record will probably be broken by her own efforts during the coming year.

Her work month after month throughout the year tells the story of her persistent work (see illustration page 30):

Month.	Lbs. of Milk.	Percentage of Butterfat.	Lbs. of Butterfat.	Lbs. of Butter.
June	1,605.5	4.76	76.43	99.55
July	1,562.7	5.26	86.35	107.95
August	1,412.7	5.68	80.36	100.45
September	1,471.6	6.40	94.28	117.85
October	1,493.2	6.80	101.67	127.00
November	1,085.9	5.53	60.06	75.05
December	1,005.3	6.84	68.78	85.95
January	936.3	7.12	66.74	83.45
February	811.4	5.95	48.28	60.35
March	941.9	5.23	49.30	61.65
April	1,085.9	5.67	61.61	77.00
May	1,159.0	5.08	58.96	73.70
Total	14,571.4		852.82	1,069.95



MOLLY W.
A splendid grade Jersey.

Great Records of Grade Cows

The seven 1,000-pound cows whose records we have reviewed are all pure-bred cows.

Of course, every farmer cannot hope to become the owner of even one cow of this calibre. But every farmer can put into

practice modern ideas of care and feeding which have brought such great success in the development of the 1,000-pound cow.

To show what can be done under average conditions with good grade cows, we are going to give the records of two Jerseys. One produced over 750 pounds of butter during the past year, the other nearly 600 pounds.

That good cows are found outside of pure-bred herds has been demonstrated during the past year.

In Iowa there has been in operation a state-wide contest in which over one hundred cows have been put to the test to determine how much milk and butter they would give in a year.

Among them have been found cows that were profitable and others unprofitable. Invariably, however, the owner's pride led him to care for his cows better while they were in the contest than he had done before. This was well, for in studying the requirements of the individual cow, and noting the results of different feeds, many lessons of value were learned that will be helpful in the future.

One of the remarkable cows in the contest was Molly W., a cow of unknown parentage except that her sire was a good, pure-bred Jersey bull.

She was only two years, three months and four days old at the beginning of her test. In 352 days she yielded 548.49 pounds of butter. In the contest cows of that age received a handicap of 37 per cent. to enable them to compete with mature cows. On that basis Molly W. produced 751.43 pounds of butter in 352 days. She was not given expert care, but kept under conditions possible on any farm in the United States. This is evidenced by the words of her owner, Charles B. Kirby, of Griswold, Ia.:

"In August, when we started, the cow was running on clover pasture and I began to feed her about 1 lb. daily of alfalfa meal.

"In September the grass began to fail and we fed some green corn with 1 lb. of alfalfa meal daily.

"In October our cows were all taken sick. We fed 1 lb. alfalfa meal and green corn, and was on clover pasture.

"In November we found out where she stood in September and started to take better care. She was fed snapped corn, 5 lbs.; 4 lbs. oats, 2 lbs. bran and 1 lb. oil meal.

"In December she was stall-fed with the same ration as November, with the addition of clover hay.

"In January I attended your lectures in Red Oak. Came home and increased the corn ration to 6 lbs. daily, with about 3 lbs. oats, 1 lb. oil meal. The cow freshened the last of January.

"In February we started her ration very light, slowly increasing until she was on her full ration at the end of the month of 4 lbs. corn, 3 lbs. oats, 2 lbs. oil meal, 2 lbs. alfalfa meal, 1 lb. cottonseed meal and clover hay.

"In March I curried and blanketed the cow daily, and fed her 4 lbs. corn snapped, 4 lbs. oats, 3 lbs. bran, 2 lbs. oil meal, 2 lbs. cottonseed meal, 2 lbs. June pasture and 8 lbs. of steamed alfalfa hay daily.

"Her April ration was the same as March.

"In May, in addition to her grain ration, she had the run of the pasture in the daytime. She had grain as follows: 4 lbs. ground corn, 3 lbs. ground oats, 2 lbs. oil meal, 1 lb. of cottonseed meal, 2 lbs. bran, 1 lb. of June pasture daily.

"In June she had 4 lbs. of ground corn, 4 lbs. of ground oats, 2 lbs. of oil meal, 2 lbs. of bran, 1 lb. of alfalfa meal, and the run of the orchard in blue grass and white clover pasture.

"In July, 4 lbs. ground corn, 3 lbs. ground oats, 2 lbs. oil meal, 2 lbs. bran, 1 lb. of alfalfa meal and cut green oats, giving her 3 medium sheaves daily.

"In August the same except 2 sheaves of matured oats daily."

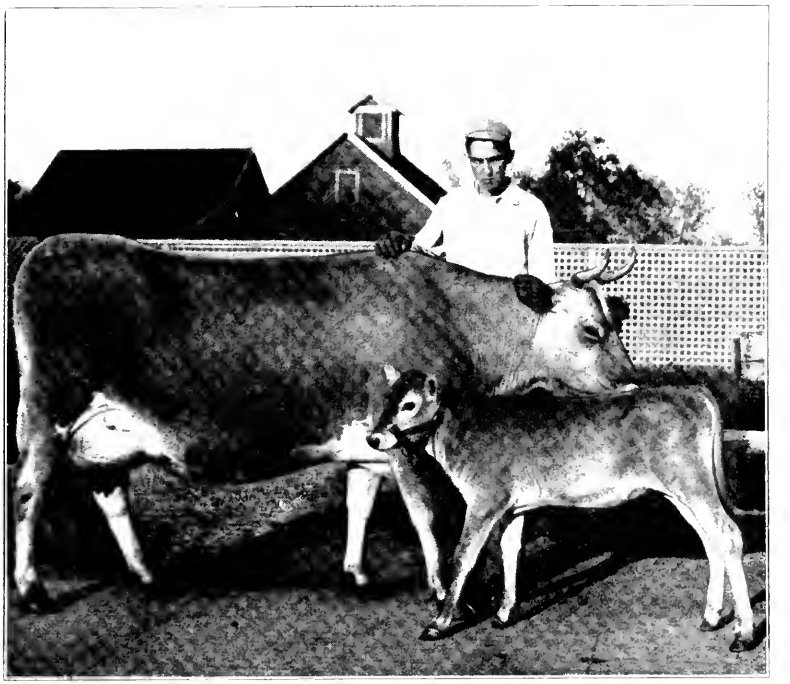
Owner's name, Charles B. Kirby; town, Griswold; county, Cass; name of cow, Mollie W.; age at entering contest, two years, three months and four days; breed, grade Jersey; date of entering contest, 8-5-03; born, 5-1-07; handicap, none; 548.49 per cent. butter.

	Lbs. of Milk.	Percentage of Butterfat.	Lbs. of Butterfat.	Lbs. of Butter.
January, 18 days.....	121.1	7.45	9.02	11.25
February, 28 days.....	629.0	6.00	37.75	47.20
March, 31 days.....	895.0	5.80	51.91	64.90
April, 30 days.....	997.2	5.88	58.68	73.35
May, 31 days.....	1,052.0	5.35	56.35	70.45
June, 30 days.....	941.2	4.80	45.18	56.45
July, 31 days.....	814.1	5.00	40.70	50.85
August, 31 days.....	854.0	4.90	41.96	52.45
September, 30 days....	790.6	5.61	44.49	55.50
October, 31 days.....	562.7	6.63	37.35	46.70
November, 30 days.....	339.1	7.03	23.85	29.95
December, 31 days.....	255.4	7.45	19.02	23.80
Total	8,252.3	5.99	466.17	582.85

The second prize grade cow in the Iowa cow contest was Jersey V., owned by F. W. Voorhies, Fairfield, Ia.

During the year she yielded 11,446 pounds of milk, which contained 600.43 pounds of butterfat, the equivalent of 706.39 pounds of butter.

Like Molly W. she received only good care such as should be given every cow. Year after year she had been producing largely, but her true worth was never known until the owner began weighing and testing her milk regularly.



JERSEY V AND CALF

A good grade cow with a promising future. Owned by F. W. Voorhies, Fairfield, Iowa.

She was seven years of age when she started her year's record, and during her life she has produced, in addition to her great and profitable milk yield, five heifer and two bull calves.

Her mother was a Guernsey cow and her sire a pure-bred Jersey bull. This is all that is known of her parentage.

She has done her part to teach the lesson of the possibilities of the good grade farm cow given an opportunity.

She has yielded four and one-third times as much as the average cow in the United States.

Were they all to yield as profitably as she the income from dairy products would mean over $3,000,000,000 instead of $800,000,000 as they now do.

Owner's name, F. W. Voorhies; town, Fairfield; county, Jefferson; name of cow, Jersey V.; age at entering contest, seven years; breed, grade Jersey; date of entering contest, 6-1-06; born 1902; handicap, none.

	Lbs. of Milk.	Percentage of Butterfat.	Lbs. of Butterfat.	Lbs. of Butter.
January, 31 days.....	674.8	6.57	44.34	55.45
February, 28 days.....	563.5	6.31	35.59	44.50
March, 31 days.....	507.5	6.31	32.05	45.05
April, 30 days.....	1,192.7	5.60	66.83	83.55
May, 31 days.....	1,392.9	5.31	73.96	92.45
June, 30 days.....	1,382.5	3.95	54.73	68.40
July, 31 days.....	1,314.4	3.97	52.18	65.20
August, 31 days.....	1,104.3	4.30	47.51	59.40
September, 30 days....	974.7	5.15	50.22	62.75
October, 31 days.....	874.8	5.71	50.02	62.55
November, 30 days.....	747.3	6.14	45.92	57.40
December, 31 days.....	717.2	6.55	47.02	58.75
Total	11,446.6	5.48	600.37	755.45

The Time to Start Better Methods and How to Begin

To increase the butter yield of a dairy herd, and to find out if there be any 1,000-pound cows or even cows with ability to produce 800, 600 or 400 pounds, there must be a definite starting point and a definite plan of procedure.

You cannot begin at any time to use proper methods and expect to find the output of your herd doubled within 80 or 100 days.

The cow that has been fresh for some time will not show a satisfactory increase. She will quite likely take advantage of extra feed or better conditions of shelter to build up her body instead of increasing milk yield.

The right time to put new methods into practice is to start with each cow during her period of freshening.

By following the plan which we outline, you can get out of each cow all the butter which nature has given her the ability to produce.

At least six weeks before freshening time, turn the cow dry and give her a rest. Don't think that because she is not giving any milk she does not need care or feed. Use this resting period to prepare her for her next year's work.

Food and care are needed for three distinct things: To complete the growth and development of the calf, to rest and render more healthful the digestive system, and to store up strength, vigor, stamina and fat to be used by the cow after freshening.

For the growth of muscle, hair, blood, cartilaginous material in the unborn calf, etc., protein is the only nutrient that will suffice.

Protein, as you no doubt know, is the nitrogenous portion of feed, the nutrient which makes bran, oil meal, gluten feed, alfalfa hay, etc., so valuable.

Now, if the dairyman continues to milk his cows up to freshening time, a large part of the protein in the feed which should be used in developing the calf is required for the milk. Consequently the cow robs her own body and the calf is weak, puny or stillborn.

Even though it lives, such a calf is predisposed toward calf scours, calf cholera and the other many ills common among calves. It stands little chance of ever developing into a big, butter-yielding cow.

Another thing, during her year's work the digestive system of the cow is severely taxed. No part is so important and no part breaks down so quickly because of hard work or heavy feeding. It should be given a good rest between the time that the cow goes dry and again freshens.

In the summer, nothing is better than the tender, delicious green pasture grasses. However, as now managed, dairy cows usually freshen in the late fall or early winter, and a substitute for pasture grasses must be supplied. Mangels, rutabagas or beets, corn silage, bran and oil meal are all easily digested feeds, laxative and cooling in nature. They tend to rest up the cow in such a way that she will be able to consume a greater amount of feed after freshening than if she were carelessly fed.

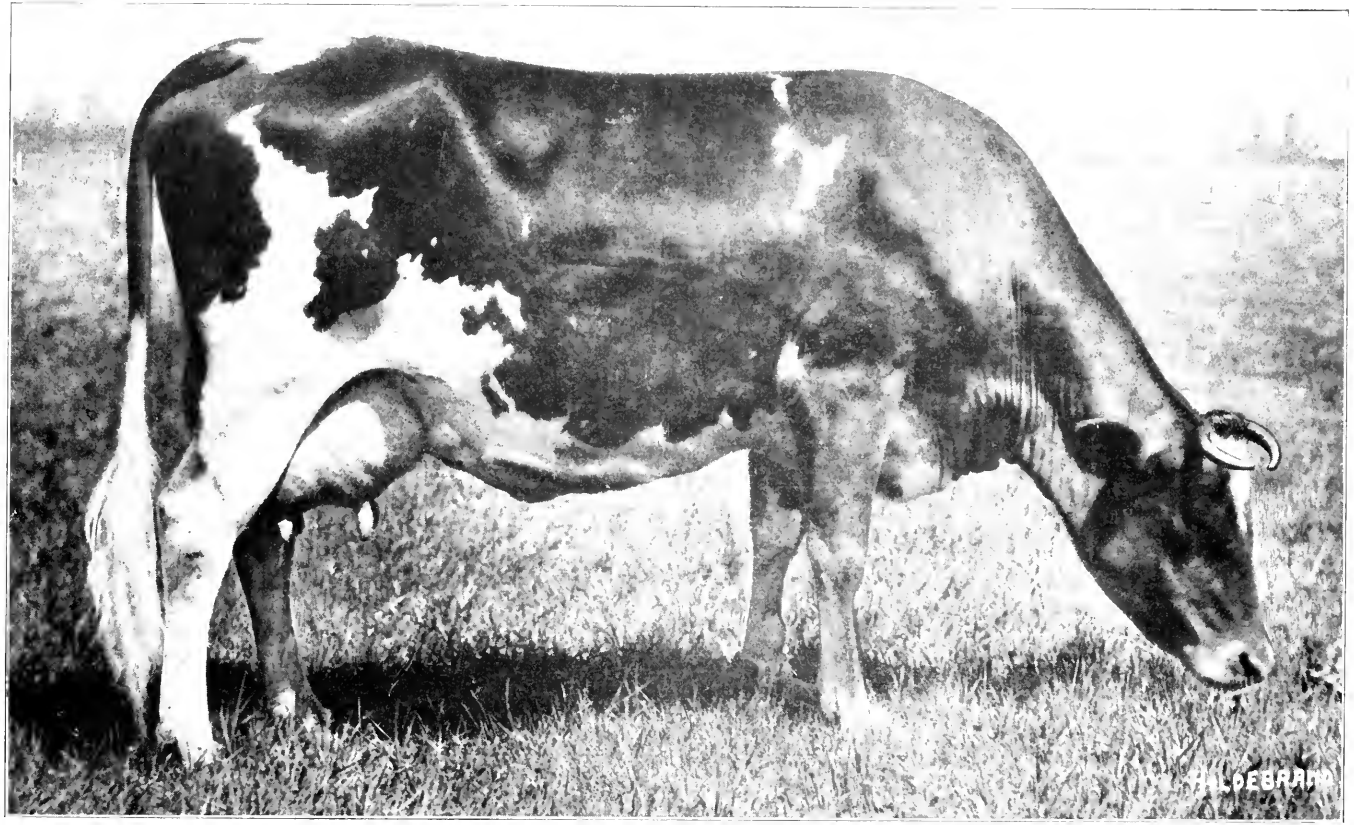
It's a mistake to think that feed given the cow during her resting period is wasted. It will return bigger profits than feed given at any other time. Her year's work depends largely upon the strength, vigor, stamina and fat which is stored up in her body at the start.

Many dairymen and breeders of dairy cattle have believed that once a cow becomes fat at any time of her life her profitable period is past. It was thought that once the habit was formed of converting feed into fat it would be impossible to again induce the cow to convert her feed into milk and butterfat. This is largely true if the cow becomes fleshy while producing milk.

But repeated experiments have proved that the more stamina and fat that can be stored up in a cow as a reserve fund, the greater the year's yield of milk and butter will be.

Proper feeding after freshening transfers most of this surplus fat flesh and vigor into the milk pail. The success with which this is accomplished is one of the greatest secrets in producing a big year's yield of milk.

A very good ration for the cow's resting period is secured



DAIRYMAID OF PINEHURST

Guernsey cow owned by W. W. Marsh, Waterloo, Iowa. The Champion three-year old of the world. Her owner has refused an offer of $10,000 for her.

by mixing two parts of ground oats, two parts of bran and one part of oil meal, supplemented with corn silage and clover or alfalfa hay. The condition of the cow will, of course, govern the amount. As a rule, eight pounds of the grain, thirty of silage and ten of hay will not be too much. If the cow is poor and lean, as most cows are after going through their year's work, fifteen or sixteen pounds of the grain will give better results. The bran, oil meal and silage tend to cool and rest the digestive tract.

Part of the bran, oil meal, ground oats and alfalfa is used for the growth of the calf.

The silage is converted into fat and stored in the cow's body. A portion of the oats is used to build up a reserve supply of vigor and stamina.

A week before the calf is to be born the grain ration should be reduced to a half pound of oil meal and a pound or so of bran mixed up in a mash. It counteracts the feverish condition of the cow and keeps the digestive organs in good shape.

It used to be thought dangerous to feed a cow before freshening because an overfleshy condition renders the cow more susceptible to milk fever. Time after time the best cow in the herd has died from this disease. Milk fever has no longer any terrors for the modern dairyman. In fact, because it is a disease that only attacks good cows, it is regarded as a favorable sign. Close watchfulness for first symptoms, and the frequent application of the air treatment, take away all danger.

The Air Treatment for Milk Fever

Where six years ago 98 per cent. of the cows affected with milk fever died, to-day 98 per cent. of them when properly treated with air are quickly restored to a normal condition by one treatment. Two are seldom necessary.

The cow should be watched closely during the first forty-eight hours after the calf is born, for it is during this time that milk fever invariably occurs. The first symptom is a dull appearance in the cow's eyes, followed later by a weakening in the hind quarters. The staggering animal finally loses all use of her limbs and lies down with her head around on her shoulder, and unless treatment is speedily provided enters a stage of stupor.

The sooner the air treatment is applied the better. It is given by an inexpensive outfit costing perhaps $3, which can be purchased from any veterinary medical supply house. Detailed instructions for use accompany each outfit. All veterinarians now possess these outfits, so if one is not present on the farm the local veterinary should be at once called.

The only precaution necessary in using the treatment is to

have the udder and teats absolutely clean and to sterilize the milk tube by boiling it fifteen minutes before insertion, to guard against outside infection.

A cow should never be allowed to drink cold water. Especially during her calving period it is important that the chill be taken from the water. Surprising results follow this practice. The udder of the cow expands to the greatest size of her whole lifetime. If conditions are right her offspring will be strong, rugged and ready to wean in a couple of days.

The bran mashes should be continued for two or three days and the calf allowed to nurse until most of the inflammation has left the cow's udder. The calf can then be weaned and taught to drink from the bucket.

How to Raise the Cow to Her Largest Milk Output

Now begins the year's work of milk and butter production. The first thirty days are very important. Upon the results accomplished during this time depends largely the volume of the cow's yearly yield. If her milk flow is allowed to linger around 25 or 30 pounds during those thirty days, it is almost impossible to ever get her past that mark; but if the 50 or 75-pound mark is reached, it is not difficult to keep her above the 30-pound mark for at least six months or for the whole year.

It is a cow's nature to yield milk for her calf for thirty days after its birth. She is, therefore, in such a condition that she responds most easily and naturally to the efforts to stimulate her milk production.

Two or three days after the calf is weaned the cow should be changed from bran mash to more solid food containing more protein. Protein more than any other nutrient stimulates the milk-secreting glands to activity. It is provided by adopting a daily ration of about five pounds of a grain mixture consisting of bran, oil meal, gluten feed or cottonseed meal in connection with grass if it be summer, or corn silage, alfalfa or clover hay if grass is not in season.

Care must be taken not to feed too largely of corn or other feed rich in carbohydrates. The cow is apt to convert her food into fat and distribute it over her body instead of converting it into milk and butterfat.

Full thirty days should be taken in bringing the cow to full feed. Many dairymen have made the mistake of putting their cows on full feed as soon as they freshen. For the first week or two there is a large milk flow, but good results are never secured in the long run from this method. If the cow does not sicken or go off her feed entirely her digestive apparatus is

weakened, so that in a short time she refuses to eat heartily and rapidly declines in her milk flow.

How Much to Feed

Every cow has two limits: She can eat only a certain amount; she can turn only a certain amount of the food which she eats into keeping up energy and producing milk. If the ration is raised too rapidly more food is often given the cow than her digestive system can take care of. Not only is there a big waste, but the organs of digestion are burned out and the cow is ruined.

Yet there must be enough of the feed to provide proper nourishment. Sixty per cent. of all the food eaten is used up in "running" the cow's body. If only 60 per cent. of the food that the cow can consume is fed, the owner has no right to expect any milk. If he gives her 70 per cent. he can expect a little milk. If he gives her 90 per cent. or 95 per cent. of the food she can take care of, he will get every ounce of milk and butterfat out of a cow that she can by nature produce.

To find out this limit of the cow's capacity where no feed is wasted, but every ounce of it counts in producing milk and butter, raise the ration gradually. Never add more than a half or three-quarters of a pound, and raise it not more often than every other day. Carefully note each day's output. (We tell how on page 35.) When the cow ceases to yield an increased flow of milk when more feed is given, reduce the amount of ration in the same gradual way. It will be found that the milk output will again increase until a pound or a pound and a half have been taken away. The cow has now been brought up to her highest level of production, large or small according to the cow's merit. Most of the fat stored up in the body has been converted into milk and butterfat, and she is again in ideal dairy form. If this is not the case, it can be pretty safely decided that she is an unprofitable cow.

The quantity of feed which will yield the most milk has also been determined. This amount of feed, varied only a pound or two daily, can profitably be given the cow throughout the year

How to Prepare the Cow's First Month's Rations

Best results always follow when the feed is given to the cow in the most palatable and easily digested form. Especially is this necessary when a quantity of food needed for the production of half a ton of butter must be consumed. All food

which passes through the cow's body undigested is not only wasted, but puts a severe tax on the already heavily worked digestive organs.

In order that all the ration be digested, all grain should be ground and fed so as to take up the smallest possible room. A certain amount of bulk must also be added to the ration. This is best supplied with light foods, such as ground oats, bran, Ajax Flakes or cut hay. Many feeders follow the advisable practice of giving the grain with the silage, mixing the entire mass together.

The digestive apparatus of the cow differs from that of the pig or horse. You know she does not stop to chew her rations, but swallows it greedily. Then during her leisure moments she regurgitates it (brings it back into the mouth) and masticates it, or, as it is commonly termed, she "chews her cud." When grain is fed alone it lies on the stomach in a heavy mass. It can neither be regurgitated for chewing nor worked upon by the digestive juices. It is crowded out of the digestive organs before the nutriment has been gotten out of the feed. Experiments show that a pound of corn and cob meal is practically as good as a pound of corn meal for feeding purposes. Cobs, of course, do not contain much nourishment, but the ground cob holds the particles of grain apart so that the food forms a light, spongy mass in the stomach and can be easily regurgitated by the cow. When it is again swallowed to pass through the different stomachs, the digestive juices can easily get at the grain, rendering digestion quick and complete. The cow is thus able to speedily manufacture feed into milk and butter, and by the next feeding time she is greedily waiting for more feed.

This illustrates the value of supplying bulky as well as palatable feed. When the cow is to be worked to the limit of her capacity, it is doubtful if her digestive apparatus should be taxed with a very great amount of ground corn cobs. It is better to mix the grain ration with corn silage, bran, ground oats or preferably cut alfalfa or clover hay. This serves the same purpose as the cob meal and also supplies the cow with much valuable nourishment.

The writer has fed tons of alfalfa hay cut up in quarter-inch lengths, giving from four to six pounds mixed with the grain daily. He is confident that this takes the place of the same amount of bran, and is doubtless equally as valuable. At the St. Louis Exposition the writer had charge of the Jersey herd in the feeding contest. The prices of foodstuffs were decided upon by a disinterested committee. Alfalfa hay was quoted at half the price of bran. Knowing that alfalfa hay contained practically the same digestible feeding nutrients as the bran, the writer followed this plan to put alfalfa in shape to be fed with the con-

centrated feed: The alfalfa was run through a cutting machine, chopped into quarter-inch length and moistened with hot water and steam. In this way it was made even more palatable than bran. By feeding six pounds of it daily mixed with other feeds, splendid results were secured. At the end of the test it was found that the cows thus fed had not only produced more butterfat in the given time, but had as a rule done it more economically.

The beauty of feeding cut alfalfa or clover is that there is little danger of the cow becoming overfed, for the volume is so large that she will leave a portion of the food before gorging herself. Moistening the cut hay adds to its palatability, and causes the particles of grain to cling to it so as to form a palatable bulky and easily digested ration.

How to Keep the Cow at Her Maximum Output

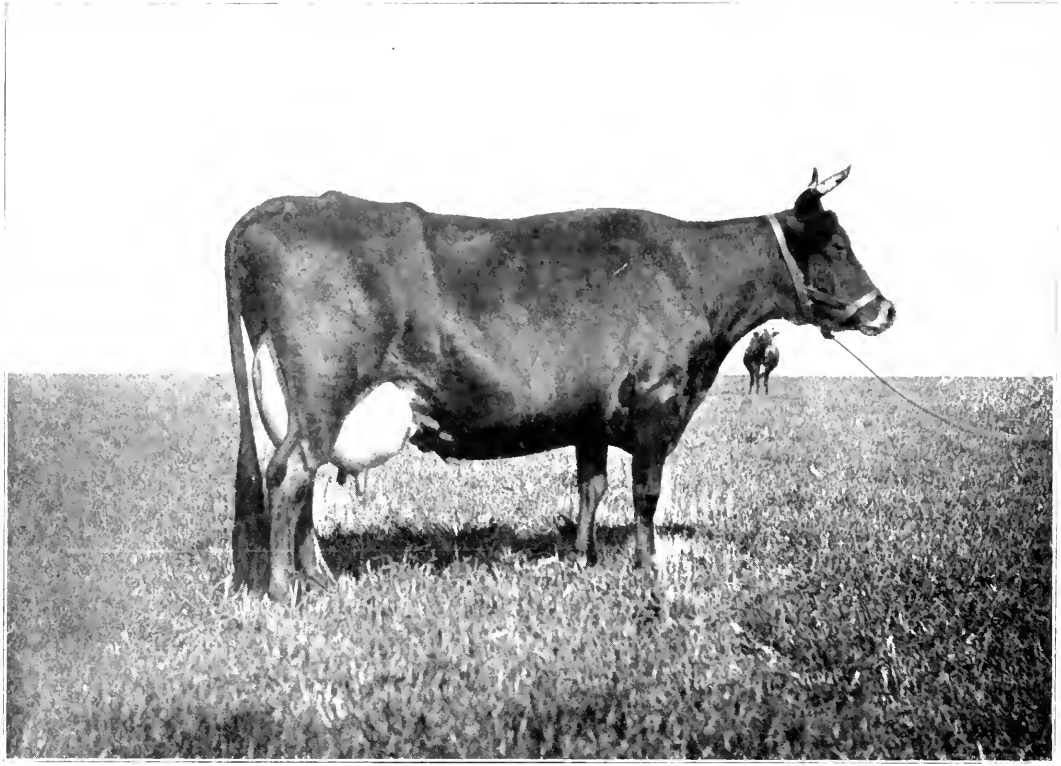
After the cow has been brought to her highest level of production the problem is to keep her there. There is no profit in the cow that yields a big volume of milk for one month or even six months and then declines in her yield or goes dry. The cow that makes the most money for her owner is the one that is a steady worker the year 'round.

A cow is much more likely to keep fresh and busy at work if she is given a variety of food. Cows get tired of the "same old thing," just as we do. After one kind of feed has been fed for a long time she will eat it less greedily and heartily—she needs a change. It's not wholly a case of *like*, but one of necessity as well. A great number of foodstuffs are more apt to contain the essential nutrients out of which milk and butterfat are manufactured by the cow.

There is no fixed rule to govern the varying of feed. It is an art which experience alone develops. The feeder must constantly study his cows to learn just how much feed and the kind of ration that will enable each cow to produce the most abundantly and profitably. He must give her at all times just what she needs to keep up her strength, energy and milk output.

For instance, if the cow increases in flesh as the milking season progresses, she should be fed less strongly with corn, corn silage, timothy hay, corn stover, hominy meal or other food rich in carbohydrates and given a little more food that is rich in protein. If a cow gets too fat she becomes lazy and does not produce the quantity of milk that she should from the food consumed.

On the other hand, if she loses flesh, which cows usually do when crowded to the limit of their production, decrease the supply of such foods as alfalfa and clover hay, oil meal, ground oats, gluten feed, bran, Ajax Flakes, pea meal, cottonseed meal, beet pulp and other feeds rich in protein, and feed more corn silage,



OLGA 4TH'S PRIDE

Jersey cow (registered number 100791). Bred and owned by George H. Sweet, East Aurora, New York, who was also the breeder of Adelaide of Beechlands, another Champion cow.

etc. These feeds tend to stimulate enormous milk production even at the expense of the cow's body if she is a good dairy cow.

In the summer, when pastures get poor, the cow's milk yield will dwindle unless she is given feed. It is poor policy to deny the cow the feed she needs. She will pay for the cost of the feed and more in increased volume of milk and butter.

Some liberal feeders, on the other hand, are apt to give their cows so much feed that they become too fat and give less milk as a result. This does not pay. Either the grain should be reduced gradually, or a feed containing more protein substituted for some of the feed which has an abundance of carbohydrates.

It is possible to feed cows entirely upon the foodstuffs raised upon the farm, consisting of perhaps timothy hay, corn stover and corn meal; but the feeder who confines his cow's rations to these feeds cannot expect to get the greatest possible profit out of his cows. Such a ration might do for a cow that yields only 140 pounds of butterfat per year. For cows that are large milk producers, especially cows with the ability of producing 1,000 pounds of butter per year, a concentrated feed is needed to provide enough nutrients for the enormous supply required.

Lessons from the Feeding of the 1,000-pound Cows

It is interesting to study the manner in which the world's champion cows were fed and see with what a large variety of foodstuffs they were provided. Had not these successful feeders considered such a procedure necessary, they would not have troubled themselves to give their cows more than one or two kinds of feed.

In every case they were careful to give a variety of tempting feed. Without exception the rations contain corn silage and clover hay as roughage and a mixture of oil meal, ground oats, gluten feed and bran, supplemented in several instances with pea meal, Ajax Flakes, cottonseed meal, hominy, corn meal, etc., to form the concentrated portion of the ration.

You will note that the feeders of the big record cows were constantly changing the quantity of the ration, adding a little corn in the place of another feed or changing the quantity of some of the other foodstuffs. They were constantly watching their cows, and varying the quantity of the feed as the condition of the animal revealed to them the need of it.

Large Rations Necessary for Large Results

The great quantity of feed received from day to day by the 1,000-pound cows may surprise many of our readers. Some may find it difficult to understand how it can be profitable to feed cows

so large a ration, or how they can be fed for a period so nearly to the limit of their capacity without being ruined for future work. In every instance, however, the 1,000-pound cows were in as good condition after the close of their test as in the beginning, and were better equipped for milk production than ever before because of the great development of their milk-producing abilities.

Every one of these cows is still alive and producing large quantities of milk and butterfat. All except one, which was always a shy breeder, are bringing strong, vigorous calves to their owners each year.

Jacoba Irene has a most wonderful record of producing a calf during each of three consecutive years, and in addition a total of over 3,000 pounds of butter. Although Jacoba Irene is not being largely fed for another year's work, she is being given the feed which she demands to keep herself in good condition, and is producing almost, if not quite, as largely as during her past years of work, when she produced 1,121 pounds of 85 per cent. butter.

The Cow Must Not be Overfed

In his eagerness for large production the feeder oftentimes overfeeds the cow. In many ways this is more to be condemned than underfeeding. Sometimes it ruins the cow's usefulness for life. Repeating Mr. Gillette's observation made in a discussion of how he had fed Colantha 4th's Johanna, he says: "She did her best work on a total grain ration of from 18 to 22 pounds per day, showing some falling off the lone week when we increased the grain to 24 pounds." This proves that from two to six pounds of grain were wasted each day during the week that she received the greatest amount of feed.

Besides, the digestive organs were put under too severe a task. Had the ration of Colantha 4th's Johanna been kept at 24 pounds daily for a long period of time, she would not only have been unable to make her great record, but likely her future usefulness would have been ruined, if indeed she had not sickened and died.

By studying the ration fed to the champion cows of the world, the manner of preparing cows for freshening and by practicing the practical methods of these most successful feeders which we have described, any cow owner, farmer, dairyman or breeder of dairy cattle will find it possible to greatly increase the production of his cows. In fact, the use of these methods during the coming year should produce twice as much butterfat from the same number of cows as during the past year; and, if the output is doubled, profits will be increased all the way from

1,000 to 3,000 per cent.—a result surely worth while in this day when the prices of all necessities, farm lands, etc., are constantly growing.

Good Care and Management

No matter how much or how little food is given the cow, or what is the character of her ration, she cannot yield a large amount of butter unless she is given proper care and management and kept under the conditions necessary for her best work.

Shelter

Steers produce greater flesh from a given amount of feed when allowed to run in an open shed, or even a sheltered barn lot, than when tied up in a warm barn. This is probably due to the fact that the feed is converted into fat and distributed over the body in such a way that they are protected from the cold and wind. No doubt this is the secret of the poor showing made by a dairy cow when compelled to remain out in the cold of winter. If she is to keep up a satisfactory yield of milk, she must use every ounce of food not needed in maintaining the body to make milk. The temperature of the barn should be kept at from 45 to 65 degrees to enable the cow to do her best work. If the barn is well built and free from openings which admit draughts, it is not a difficult matter to keep the barn at least this warm when filled with cows, owing to the great amount of animal heat given off.

Fresh Air and Sunlight

The milk-producing nutrients after being digested are carried from the digestive system to the udder, the cow's milk-making factory, by the blood. If this is to be done in a proper manner the circulation of the cow must be healthy and the blood pure. To keep the blood pure, fresh, pure air containing a sufficient quantity of oxygen is required. This necessitates good ventilation. The air in the cow barn should be automatically changed every three or four hours. There are many systems which can be installed in the barn when it is being built, main among which is the King System.

As a rule, however, the barns are already present on the farm. The chief fault of most of them is that they lack window space. For every cow there ought to be a window area of six square feet to let in sunshine, light and fresh air when necessary. By covering every other window in the barn with No. A muslin, plenty of air will be admitted at all times and draughts will be

prevented. Without doubt this is the best manner of ventilating old barns used for the stabling of dairy cows.

Too many cow barns are dark, damp and foul, due to lack of window space. In such barns it pays to cut out a window space two feet wide and three feet high for each cow. Sunshine is the greatest destroyer of germs and the best help in keeping the barn dry. With this cheap, efficient method of supplying light, sunshine and fresh air, barns, even on rented farms, can be converted from incubators of germ diseases into healthful stabling quarters. The cows will be kept in better and more vigorous health, they will require less feed to keep up their bodies, and, other things being equal, will produce 20 to 25 per cent. more milk.

Feed and Milk Regularly

No animal on the farm is such a creature of habit as the dairy cow. If she gets used to drinking water but once a day, it takes quite a time to induce her to drink oftener. Cows accustomed to being milked at a certain hour of the day will not give down their milk at any other time. For this reason the best results can be obtained when regular hours and methods are used in the feeding, milking and caring for the cows.

No noise or confusion should be permitted around a cow. She does not control the giving down of her milk at milking time. The milk flow is governed by the nervous system. Cruelty and excitement affect the cow's nervous system in such a way that she cannot give down her milk in a normal manner.

Fall the Best Time for Freshening

On the average farm the great majority of dairy cows freshen in the springtime. If all the advantages of freshening in the fall were understood, this condition would be reversed. When the cow freshens in the fall she goes into winter conditions during her period of greatest daily yield. Prices are at their highest level and profits the greatest. At this time of the year the farmer has plenty of time to give to the feeding and care of his cows. In the spring there is farm work of all sorts to be done and the cow usually gets scant attention.

When spring comes and the fall-freshened cow is beginning to decline in her milk flow, the effect of the green pasturage is to again freshen her so that she has a good yield all through the spring and early summer. By the time the period of heat and flies has come she has rounded out a far greater production than if she had freshened in the spring.

She is dry during the hot summer months or harvest, when even the cow freshening in the spring is dry or almost dry, so that the time spent in the harvest field will not interfere with her annual milk yield.

On the other hand, the cow that freshens in the spring produces her largest yield of milk in May, June and early July before heat, flies and dwindling pasturage conspire to cut down her daily flow. Before the fall rains renew the pasturage she is almost dry. The better pasturage of fall revives her flow a little, but she does not return to her former yield. She becomes poor, loses vigor and stamina and has not the strength required for a large production. Then cold weather sets in with its dry feed, tending to cause a still further decline. By the middle of winter she has gone dry or is giving so small an amount of milk that she is not making any profit.

It has been conservatively estimated that a cow will produce from 15 to 20 per cent. more milk in a year if she freshens in the fall than if she freshens in the spring. Told in profits, this means two or three times as much net profit for the year's work.

Taking the Chill from the Water

The temperature of the cow's body is from 98 to 100 degrees. Every drop of cold water that the cow drinks must be brought to the temperature of the body by using up expensive feed in her digestive apparatus. It pays, therefore, to take the chill from the water given the cow by heating it with coal, wood or cobs. This is far cheaper than having it done in the cow's body with 50-cent corn.

The Hired Help Problem Solved by Fall Freshening

The farmer is constantly face to face with the problem of getting good hired help. Efficient help demand steady work. The farmer as a rule hires men for only the spring, summer and fall months, letting them leave during the winter. By having a number of cows which freshen in the fall the hired help can be kept the year through.

The Folly of Pasturing Too Early

Springtime is always welcomed by the farmer because it means an end to the winter's work of caring for and feeding the cows. So anxious is he to get rid of this work that he often turns the cows to pasture before the proper time. Early grass is

THE GUERNSEY COW, DOLLY DIMPLE

Bred and owned by F. L. Ames, North Easton, Massachusetts. She excels all other cows of a like age in the world.

commonly termed washy, and contains little nutriment. When turned off winter feed early in the spring, the cow does not always decrease at once in her milk flow. She is stimulated by the succulence of the pasture grasses, and for a time produces more nutriment in the milk than is contained in the grass she eats. In other words, she robs her body as long as she can. This quite naturally puts her in a weakened condition—in poor shape to go through the summer.

Eaten down closely so early in the spring, the pastures cannot supply the great abundance of food that they could had they been given a chance to get a good start. In her weakened condition, and with the pasture becoming poorer and poorer, the weather hotter and the flies pesky, the cow rapidly declines in her milk flow, and much profit is sacrificed.

By the use of the silo, cows can be kept in the barn and lots until the pasture grasses have secured a good start and have had a chance to store up in their stems and leaves the nourishment needed by the cow. When the hot months come around there will be still plenty of grass left in the pasture for the cows to feed upon.

When the herd is kept off the pastures until the middle of May or the first of June, according to the earliness of the season, an increase of from 10 to 20 per cent. in the annual milk yield can be obtained.

Summer Comforts for the Cow that Pay

It has been proved time and time again by successful dairymen that not only the cow's milk flow but the percentage of butterfat which her milk contains can be increased by little things that add to her comfort.

One of these profit-making comforts is to allow the cow to remain in the barn during the heat of the day when the flies are at their worst, and feed her with green feed.

If the herd of cows is large it is a good thing to have a summer silo and allow the cow to eat silage during the day and get the nutrients she must have. This is scarcely practical where only a small herd is kept. Twelve cows will eat only enough silage to warrant the use of a nine-foot silo. A building of this diameter and of the necessary height is liable to be blown over by even a small wind storm. For those who own a small herd it is advisable to raise soiling crops on which to feed the cows in the daytime.

In the evening, when it is cooler and the flies are less annoying, the cows can be turned to pasture to graze and exercise.

Where green foods are grown, those of a leguminous character are the best, because they furnish the protein which stimulates milk production and takes away the necessity of purchasing this necessary and high-priced nutrient.

The following table illustrates the kinds and amounts of feed to provide a herd of 12 with all the green food they can consume from the first of May to the first of October, when the winter silo is ready for use.

Crop.	Seed per Acre.	Time to Seed.	Acres.	Time to Feed.
Rye	2 bus.	Sept. 10	¾	May 15 to June 1.
Alfalfa	20 lbs.	Aug. 12	2¼	June 1 to June 15.
Clover	20 lbs.	Aug. 12	1	June 15 to 25.
Peas and oats each	1½ bus.	Apr. 15	¾	June 25 to July 10.
Peas and oats each	1½ bus.	Apr. 25	¾	July 10 to July 25.
Alfalfa, 2d crop	20 lbs.	Aug. 12	2¼	July 25 to Aug. 15.
Sorghum and cow peas after rye	75 lbs. sorg. 3 pecks peas	June 1	¾	Aug. 15 to Aug. 30.
Same after peas and oats....		July 25	1½	Aug. 30 to Sept. 30

This table takes it for granted that alfalfa can be grown. This is true over a large portion of the world where alfalfa can not be grown, sweet clover fed in a green state takes its place. The cows will eat it greedily. Ofttimes it is desirable to allow it to take the place of green rye. Only 5½ acres are needed to provide enough green feed to supply 12 cows all summer.

Fall Management

There is a second crop of clover and a third crop of alfalfa or sweet clover that can be cut and fed during the winter months as hay. As fall approaches, the cows which are to freshen must be turned dry and put in shape for the next year's work. Those that are yet giving milk, or those that freshen in the springtime, should be placed in the barn and under winter conditions when the first cold rains of fall come, else they will fall away largely in their milk flow.

If there is a silo on the farm it is usually filled in the latter part of September and is ready for use at any time.

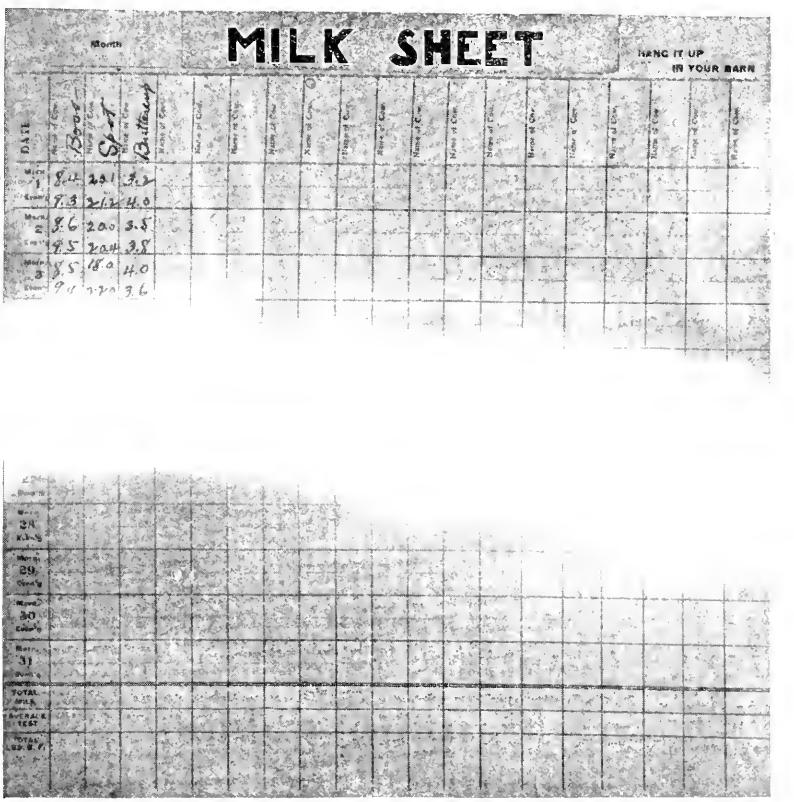
We have spoken of the mistake of turning cows to pasturage too early in the spring. It is equally as serious a mistake not to

put them in the barn early enough in the fall. Every fall rain, every cold, disagreeable, windy night has its serious effect upon the milk flow and cuts into the profit of the dairymen.

The Importance of Knowing Each Cow and How to Know Her

In the introduction we mentioned the fact that the farmers and dairymen of the United States are milking 14,000,000 cows twice a day, spending good money to feed them, devoting many hours in their care, and yet are not getting one cent of profit out of them.

Allowing ten minutes for the milking and care of each of these cows 700 times a year, it is found that on the average every



farmer in the United States is spending 27.2 days in work for which he gets not one cent of profit.

It is not the farmer's nature to work for the fun of it. There is not a farmer in the United States who will keep feeding and milking cows which he knows are not paying for their feed and keep.

There is just one way to account for the fact that he keeps on feeding and milking these 14,000,000 unprofitable cows; that is, he does not realize that he is doing it. He has not learned the necessity of knowing the individual cow.

He is milking good and poor cows alike, giving them the same degree of care, not knowing that part or all of the profit he is earning from part of his herd is being wasted because some of the remainder are not even paying for their feed.

There is only one way to find out which cow is a profit-maker and which should be fattened and butchered without delay, and it is not hard to learn and practice. That way is by the Babcock test, the scales and the milk sheet.

By this method the poor cow can be detected very quickly, and at the same time the milk and butter production of each cow is known at the end of each month.

Not only are the poor cows found, but the good ones as well, so that the owner knows from which cows to save his heifer calves. When this is accomplished he has taken a big step toward doubling the production of his herd, provided the head of his herd is a sire whose maternal ancestry was of the highly productive dairy type.

The Scales and the Milk Sheet

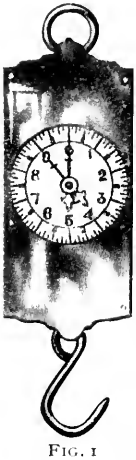


FIG. 1
MILK SCALE

For the quick and convenient weighing of the milk there are many kinds of scales on the market which will do if they weigh correctly. The handiest kind is shown in illustration Fig. 1.

It costs from $3 to $4, will weigh up to 60 pounds, and is substantial enough to keep accurate for many years. To weigh each cow's milk is the work of a few seconds. It takes but a second or two more to record the weight on the milk sheet, a most practical form of which is shown on page 45.

The sheet is so ruled that each cow's name appears at the top of her own column, and each day's milk yield, both morning and evening, can be put down. At the bottom of the page are spaces for the month's total of pounds, the average butterfat test and the total pounds of butterfat. This is

found by multiplying the total amount of milk by the percentage of butterfat shown in the average test for the month. By the use of this sheet each cow's exact work is known. There is no guesswork about which cow is the good cow and which is less profitable.

The Babcock Test

To determine the richness of milk in butterfat it is necessary to take a sample of each milking for at least two days a month. Have a clean half-pint bottle for each cow, place in the bottom of it a corrosive sublimate tablet to keep the milk from souring. Mark each bottle "poison," for the tablets are poison, and write the cow's name or number on the bottle provided for her. After each cow is milked and the weight recorded on the milk sheet, pour the milk from one pail to another to thoroughly remix the cream which has raised during the milking. Then, with the dipper shown in Fig. 3, take a sample and pour it in the proper bottle. Repeat this for four milkings, and each bottle will contain a mixture of milk, representing a true test of the richness of the cow's milk. Such samples should be taken each month.

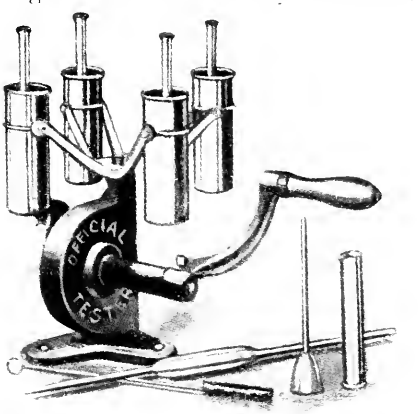


FIG. 2.—BABCOCK MILK TESTER

Fig. 2 shows one of the several forms of the Babcock tester. These testers can be purchased from any creamery supply house in sizes ranging from one large enough to test four cows, up to one large enough to test 24 cows at one time. To make the test requires but 15 to 20 minutes. The whole outfit, scales, dipper, milk sheets for a year, glassware, tester, corrosive sublimate tablets, acid and everything else necessary, can be purchased for about $10.

It Pays to Take Time to Test the Milk

The time that is needed to carefully watch what each cow is doing is very profitably spent. The time taken, in fact, is far less than is wasted in milking poor cows. This work can be turned over to the boy or girl and given them as a regular chore. They will probably do it more accurately and regularly than some one else who has lots of other things to think about.

It is excellent training for the boy or girl—gives them practical problems in adding and multiplying, and also interests them in the work of the farm. It is the writer's belief that in the near future every country school will teach its pupils how to weigh, sample, test and keep records of the cows on the farm. Already some of the more progressive schools are doing this very thing with most gratifying results.

FIG. 3 MILK AND CREAM DIPPER

In one Iowa high school the students were requested to bring samples of milk from home on certain days for a month. One 12-year-old boy whose parents owned but one cow began keeping account of the cow's production. He had also been taught quite a little about feeding. His mother reluctantly gave him permission to purchase the feed and feed the cow for one month. At the end of the month he was able to show that he had saved $1 in the cost of feed and that the cow had produced $3 worth of milk and butterfat more than the preceding months.

The dairyman who will decide to test his cows will be just as surprised as was the mother of this wide-awake boy. In a year's time he will learn some most surprising facts about his cows. He will quite likely find standing side by side, under the very same conditions which he has fed and milked with equal care, two cows, one of which has produced 100 pounds of butter and the other 400 pounds. Sell this butter at 28 cents per pound. The income of the one will be $28 and the other $112.

Suppose it cost but the small sum of $27 to feed each of these cows; $1 profit would be realized on the first cow and $85 on the second. Had her feed cost twice as much as the feed of number one, or $54, she would have still earned $58—fifty-eight times as much profit as that earned by the first cow.

There are few dairymen who have weighed and tested their milk who have not found this very thing. In many instances it has been found that one cow is making more profit than all the other cows combined. Another lesson learned by locating the profitable cows is that they are invariably of the same type and conformation—what may be termed the extreme dairy type of cow, which devote the food they consume toward milk and butter production rather than to beef.

The Sacrifice of Not Knowing the Ability of Each Cow

In addition to the lost opportunity of greatly increasing profits from dairy products, other great possibilities of profit are sacrificed in not knowing the individual cow.

Who can tell how many cows have lived and died with possibilities of half a ton per year butter production in them which were never developed?

Jacoba Irene, the Jersey cow that made the marvelous record of 3,148.8 pounds of butter in three years, was sold as an ordinary good pure-bred cow. The prices on such an animal vary from $85 to $200.

Relative to her present value, Mr. Auten, her owner, says, "I have no fixed price on her, but she is paying me big interest on an investment of $10,000 per annum." Had her former owner known her future prospects, it is certain that he would not have sold her for $200 and kept in his herd other cows which were earning perhaps little above the cost of their feed.

A similar instance occurred when Yeska Sunbeam, one of the 1,000-pound cows, was sold to her present owner for $75 or $85.

Missy of the Glen, who has a record of 1,113 pounds of butter in 365 days, was purchased in her younger days for $75.

The owner of Colantha 4th's Johanna saw in her a big future, yet he was led to sell her bull calf prior to her record for $300. After her record had been made, he bought back this bull for $2,000 and resold him to head one of the greatest Holstein herds in the world, for $8,000 cash.

These instances show the possibilities that exist in every herd of dairy cows, and which can be realized by following the methods for finding and developing the good cow, as set forth in this book.

Building Up a Better Herd

We have considered thus far the immediate improvement of the cows now owned on the farm.

We have seen that it is possible to double the butter production of the herd by better care and feeding of the cows. Just as surely can the production be increased by at least another 50 per cent. by the use of sires whose mothers are of the productive dairy type and by raising the calves to cowhood in the proper manner.

It has been found that the proper selection of a sire will result in cows capable of producing 100 pounds more butter per year than their mothers. On the contrary, if the sire is not of good dairy strain, the cow reared and fed under the same conditions will produce less butter than the mother.

How to Select a Sire

It can be readily seen, therefore, that too much care cannot be given the selection of the bull to head the herd. Never should a grade or a scrub bull be used. In many instances the scrub animal may present as good an appearance as a pure-bred sire; his mother, too, may be of very attractive appearance, and yet the poor milk-yielding traits of some remote ancestor may be transmitted to the offspring because of the laws of reversion.

There is no danger of this kind if a pure-bred bull is used. For hundreds of years intelligent breeders have been developing a strain of dairy cows to consume a large amount of food and convert every possible ounce of it into milk and butterfat.

Which Breed

There are four breeds of dairy cows: Holstein, Ayrshire, Jersey and Guernsey. That each of these breeds has produced 1,000-pound cows proves that there are good cows in all of them. The personal like and dislike of the breeder and the conditions on his farm should, therefore, govern his choice. If he has a preference for one of the dairy breeds he will accomplish better results by sticking to that particular breed. Once he has selected a sire of that breeding, he should follow up generation after generation with the same blood lines. In the course of six generations his herd will be practically pure bred. The rapidity with which a pure-bred dairy sire builds up the herd to a high grade is shown in the following table:

Generation.	Blood.	Per Cent. Improved.	Per Cent. Unimproved
1	1/2	50	50
2	3/4	75	25
3	7/8	87.5	12.5
4	15/16	93.75	6.25
5	31/32	96.87	3.12
6	63/64	98.43	1.56

Ofttimes the use of pure-bred dairy cows is desired, but as a rule it costs too much to buy a herd of pure-bred cows. An excellent plan is to select good sires, breed up the herd which is on the farm, and perhaps select one pure-bred cow. Raise her heifer calves carefully year after year. A splendid pure-bred registered dairy herd will result in a surprisingly short time. As an illustration on this point, the writer knows one of the most popular breeders of dairy cattle in the United States who boasts

of the fact that he bought only one cow—Golden Eye—which cost him when she was young $300. In a single sale he sold 90 head of cows, calves, etc., all the descendants of this one cow, for $8,000. Since that time he has sold six head of calves for $550. The number of descendants from the cow up to 1907 was between six and seven hundred.

From the products and offspring of this one cow he has paid for his farm and raised his family. He still has on his farm one granddaughter of the old original cow. She is now twenty years old and has produced for him a dozen calves. To use his own words: "She has been what would be called a first-class dairy cow for eighteen years." All this has resulted from the use of good sires which he purchased from time to time, the selection of one most excellent and well-bred cow to be used as a foundation, and the careful raising and care of the female off-spring.

Raising Calves

We have previously described the preparation of the cow for freshening so as to insure healthy, strong, vigorous calves. The calf should be allowed to remain with its mother for the first two or three days in order to get a good start. After this time it should be taken away from its mother, placed in a warm, dry, ventilated stall and fed three pounds of warm, whole milk, direct from the cow, three times a day for two weeks. At the end of this time it should be fed five pounds of milk twice a day. Skimmed milk can gradually be substituted for the whole milk, taking about two weeks to make the change.

When the calf is four weeks old it should do well on a ration of skimmed milk, in each feeding of which is placed a teaspoonful of soluble blood flour. This takes away all danger from scours and supplies the calf with bone and muscle-growing material.

At about this age the calf begins to desire some solid material in conjunction with the milk. It should be given access to clover or alfalfa hay and a regular feeding of grain.

It is customary for calves to suck each other's ears after drinking milk. This harmful habit can be overcome by feeding the calves their grain immediately after they drink their milk. The quickest way to teach them to eat and to overcome this habit is to place a small handful of grain in the mouth of the calf immediately after it drinks its milk.

A good grain mixture for the calf whose digestive apparatus is at this time in a state of development is equal parts of whole oats, cracked corn, bran and oil meal.

Care should be taken not to overfeed the calf with skimmed milk. Too many feeders believe that because the butter has been

taken out of the milk a great amount of the skimmed milk should be given. As a result many calves sicken and die. During the first six weeks of the calf's life it should never receive more than 10 pounds of milk daily, and never more than 20 to 24 pounds a day, even up to the time it is six months of age.

When given too much milk the youngster will not eat grain and hay. As a result it does not grow or develop into as good a cow as when less milk is fed.

When six months of age the heifer may be taken off milk entirely and given all the clover or alfalfa hay and growing green foods she can eat until she is 24 to 26 months old, when she should freshen into the cowhood stage.

The Best Age to Sell Calves

It seldom pays to keep dairy-bred bull calves longer than four weeks unless their breeding is such that they can be sold at a good price for breeding purposes. To raise them for steers is not wise. Having been bred along dairy lines they will not bring enough as yearlings or 2-year-olds to pay for the feed they have consumed. Sold at the age of four weeks, the calf will demand a large enough price upon the veal market to guarantee a goodly profit.

What Denmark's Dairymen Have Done

That the average butter yield of American cows can be raised a great deal above its present amount of 140 pounds per cow is shown by what has been done in Denmark.

Thirty-five years ago the average production of cows in Denmark was 120 pounds. With the aid of the government it was soon demonstrated that far greater results were possible in improved dairying. Co-operative testing associations were formed, each association hiring a man to go the rounds of its members and test the milk yielded by each cow. The farmers were enabled to get rid of their poor cows and learned how to feed their good cows for best milk results. As a result we find the cows of Denmark producing to-day 240 pounds of butter each year. This means that the amount of butter has been doubled because each farmer gave special attention to each individual cow and cared for her in such a way as to get the most out of her.

The American farmer lacks none of the intelligence and industry, ambition and progressiveness of the farmer of Denmark or of any other country. Just as fast as he will adopt these same careful, systematic methods which we have outlined, so fast will the production of America's cows be doubled and even trebled.

What One Dairy Farmer Has Done

We have described in detail the methods which have brought success to the leading feeders and dairymen. We have seen what careful methods will do for the grade cow as well as for the pure-bred animal. There is not a farmer or a dairyman in the country who cannot profit by the methods we have outlined. The writer is acquainted with a Hollander who came to America without a penny. After several years of work as a hired hand he started to work a farm "on shares." The owner furnished him everything except the horses, and gave him half. The first year he kept no records of the dairy herd. He figured that each cow had brought him a gross income of $28.50. Realizing that this had barely paid for the feed, he decided to become better acquainted with each cow of the herd. By weighing and testing the milk he found out the good cows, fed them better and substituted their heifer calves for the poor cows. The next year the return per cow was $30, the following year $41.20, the fourth year $45.84 and last year $53.01. The net profit returned by each cow last year was $36.09, counting the value of the skim milk.

Had this dairyman been content with the production of his cows, as are thousands of farmers and dairymen, he would have kept on milking cows that brought him an income of $28 each year.

To-day he is making an average net profit on each cow of $36.09.

Surely it will pay the reader to take the time to know his cows and put into practice the successful methods of care and feeding which we have described.

Dairying Compared With Grain Farming

While the land that supports the dairy herd grows richer each year, the farms which are devoted to growing and marketing grain are growing constantly poorer and less productive. With every ton of corn that is sold off the farm for $18 to $20, $6.50 of fertility is carried away. A ton of wheat worth $35 removes $7.50 worth of fertility. A ton of beef worth at the present high prices $150 to $200 takes with it about $17 worth of richness. But a ton of butter worth to-day $600 takes with it only 49 cents' worth of fertilizing ingredients.

Feed that is rich in protein produces manure of the greatest fertility value. As large milk production demands foods containing a large percentage of this nutrient, the dairy cow returns to the soil many, many times the fertility she takes from it.

Dairying Remaking New England Farms

For many years thousands of acres of farm lands in New England have lain barren, stripped of the natural fertility that was stored up in them by the thoughtless farmer, until they could no longer secure a livelihood. Reduced to poverty, the farmer was compelled to abandon his farm and seek employment in the cities. By the aid of the dairy cow these farms are being reclaimed. Their owners are building up bank accounts faster than ever before.

The Dairy Cow a Home Builder

Thus it is seen that by ability of bringing a constant profit and of enrichening the soil the cow is, more than any other animal, a home builder.

The grain farmer grows and markets his crops, depriving the soil of its fertility, with a consideration of immediate gain only. He works his farm during the crop-growing season, markets his grain and has little interest in the farm until another season. His thought is not to make home comfortable, but to accumulate enough to retire and move to town.

The dairy farmer, on the other hand, has a good-paying business the whole year through. The same pride that he takes in building up his herd and his farm leads him to make the most comfortable home at his command for himself and his family.

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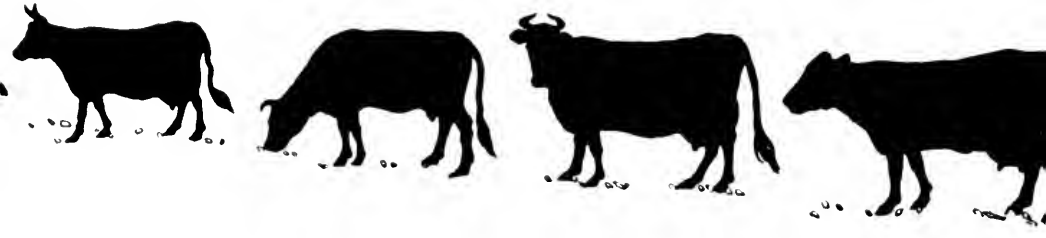
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